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WAR MACHINE

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Armed Forces
of the World:
Soviet Army
(Part 2)

Middle East
Flashpoint:
The Gulf

Soviet ASW
Groups in
Operation

'Krivak' in
Action



A fully illustrated guide to Modern Frigates (Part 2)

WAR MACHINE

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Editorial Offices

War Machine
Aerospace Publishing Ltd
179 Dalling Road
London W6 0ES

Managing Editor: Stan Morse

Editorial: Trisha Palmer
Chris Bishop
Chris Chant
Ian Drury

Design: Rod Teasdale

Colour Origination: Imago Publishing Ltd,
Thame, Oxon

Typesetting: SX Composing Ltd

Film work: Precise Litho Ltd

Artists:

David Etchell
Tony Gibbons



Consultant Editor: Major General Sir
Jeremy Moore KCB OBE MC, Comman-
der of British Land Forces during the
Falklands campaign.

Distribution and marketing offices:

Orbis Publishing Ltd
Orbis House
20-22 Bedfordbury
London WC2N 4BT
Telephone: 01-379 6711

Circulation Director: David Breed
Marketing Director: Michael Joyce

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Modern Frigates (Part 2)

Frigates today are ostensibly designed for anti-submarine warfare, and in major fleets are used in this role. In smaller nations, however, such vessels must serve a variety of purposes.

Other than the Soviet Union and China, which each produce their own frigates, most non-Western nations tend to buy either off-the-shelf standard frigate designs in service with NATO navies or, if they can afford it, a vessel customized for their own particular requirements. One of the most recent examples of the latter is the Saudi Arabian order to France for four Type F2000 frigates. In terms of capabilities these vessels will be able to outperform most of the frigates in service with the NATO navies today. They are based on state-of-the-art electronics, and because of their sophistication may well cause some operating problems to their owner.

At the other end of the scale is the large missile corvette, or small light frigate depending on which view you take of the type. These are being bought by a number of navies as cheaper alternatives to more conventional frigates as replacements for World War II units that are now hopelessly out of date.

With its overall naval policy in mind, the Soviet Union subscribes to both philosophies, producing highly sophisticated designs for ASW

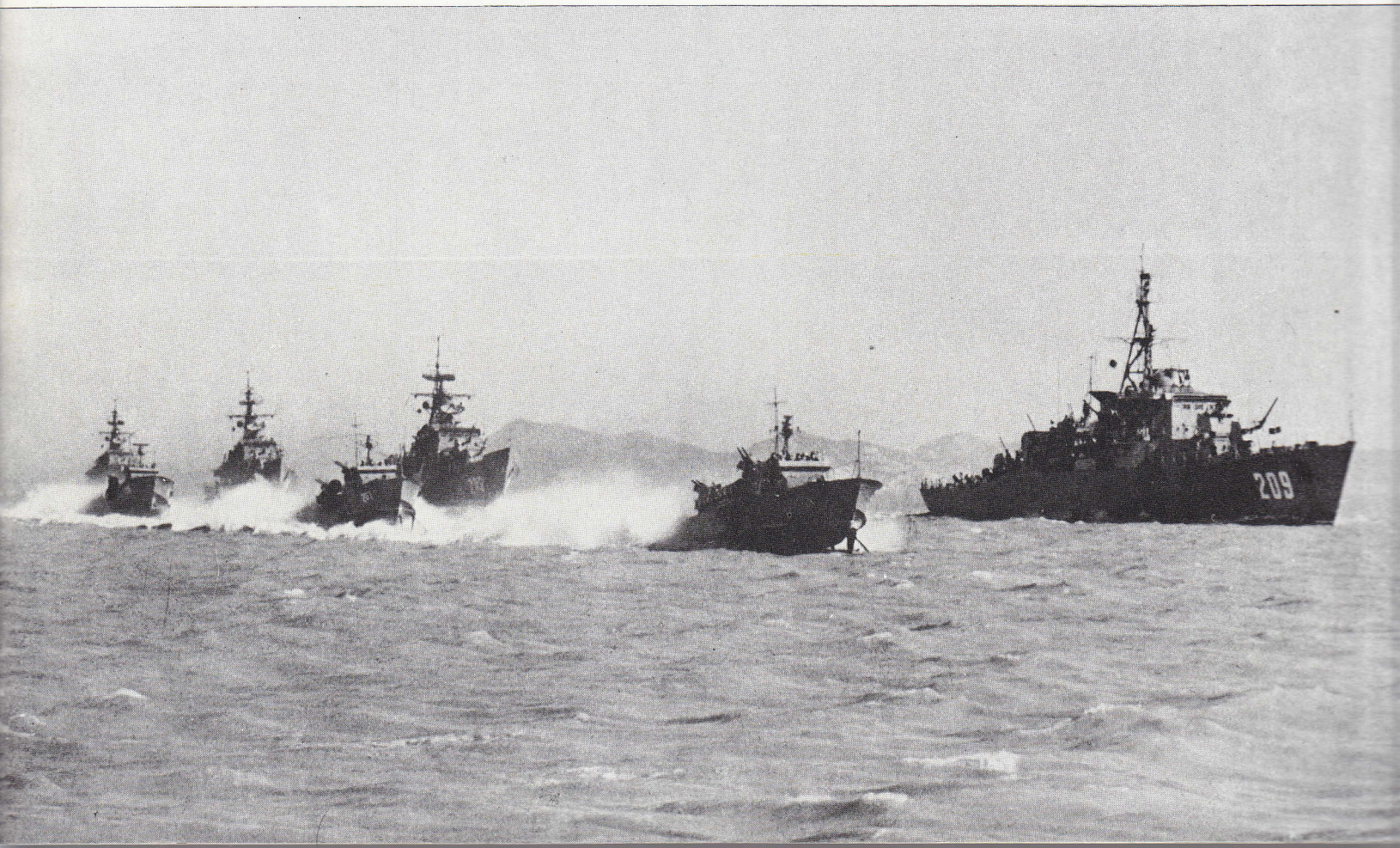
The Brazilian general-purpose frigate Constitucao (F42) was built by Vosper Thornycroft in England as part of the six-ship 'Niteroi' class order. She is armed with four single launchers for the MM.38 Exocet as well as two single Mk 8 4.5-in (114-mm) DP guns and Sea Cat SAM systems.



operations and smaller, cheaper but still highly capable designs for surface strike missions. Surprisingly, it is only in recent years that the USSR has built a frigate-type class with an integral onboard ASW helicopter. In practically all Western nations, a frigate without its own helicopter is nowadays the exception.

Although China designs her own frigates she still has a long way to go before she catches up with either the West or the Soviet Union. Lacking modern technology sources, China has frigate classes that appear robust enough, but certainly do not match up in terms of electronics and armament subsystems, to the extent that the ASW weapons carried are still depth charges or based on 1950s-technology Soviet rocket-launchers. This is all expected to change in the course of the next decade.

A 'Jiangnan' class frigate of the People's Republic of China leads a mixed flotilla of 'Riga' class frigates and 'Huchwan' class torpedo-armed hydrofoils in a demonstration of China's rapidly-expanding naval power.





EAST GERMANY

'Parchim' class

Previously known to NATO as the 'BAL-COM-4' class (Baltic Combatant No. 4) and to the technical press as the 'Koralle' class, the 'Parchim' class of light frigates is believed to be based on the Soviet 'Grisha' design with local modifications to suit its use by the East German navy. Built at the Peenewerft shipyard at Wolgast from the late 1970s onwards, the 'Parchims' are replacing the unsatisfactory 'Hai III' class of large patrol craft that was constructed in the mid to late 1960s. The new class is designed primarily for coastal ASW operations, but carries the heavy AA armament characteristic of Warsaw Pact naval units operating in the Baltic

Sea area. So far only nine named ships have been identified (the *Wismar*, *Parchim*, *Bad Doberan*, *Buetzow*, *Perleberg*, *Lübz*, *Teterow*, *Purna* and *Anklam*), though another seven sister ships, as yet unidentified, are known to be in commission. A class total of 18 is believed likely, with possibly six units attached to the navy-commanded Coastal Frontier Brigade at Rostock. This performs duties similar to those of the Maritime Border Directorate of the Soviet KGB. For this role the vessels' armaments may well be modified to include additional guns at the expense of some ASW capability.

Specification

'Parchim' class

Displacement: 960 tons standard and 1,200 tons full load

Dimensions: length 72.5 m (237.9 ft); beam 9.4 m (30.8 ft); draught 3.5 m (11.5 ft)

Propulsion: two diesels delivering 8948 kW (12,000 hp) to two shafts

Speed: 25 kts

Armament: two quadruple launchers for 32 SA-N-5 'Grail' SAMs, one twin 57-mm AA and one twin 30-mm AA guns, four single 406-mm (16-in) tubes for anti-submarine torpedoes, two 12-barrel RBU6000 250-mm (9.84-in) ASW rocket-launchers with 120 rockets, two

racks for 24 depth charges, and between 20 and 30 mines according to type

Aircraft: none

Electronics: one 'Strut Curve' air-search radar, one 'Muff Cob' fire-control radar, one TSR333 navigation radar, one 'High Pole-B' IFF, two 'Watch Dog' ECM systems, two 16-barrel chaff launchers, one medium-frequency hull-mounted sonar, and (in some on starboard side of the main superstructure) one high-frequency dipping sonar

Complement: 60



USSR

'Grisha' class

Built as a *malyy protivolodochnyy korabl'* (MPK, or small anti-submarine ship) between 1968 and 1974 the 'Grisha I' class production run ended after only 16 units. These provided a more specialized ASW capability than the earlier 'Mirka' and 'Petya' classes. They were followed during 1974 and 1976 by eight 'Grisha II' class *pogranichnyy storozhevoy korabl'* (PSKR, or border patrol ship) units for the Maritime Border Directorate of the KGB. These differed from the 'Grisha Is' in having a second twin 57-mm AA mount substituted for the SA-N-4 'Gecko' SAM launcher forward and in having no 'Pop Group' fire-control radar. From 1975 onwards to the present the 'Grisha III' class has been the Soviet navy's production model. A 'Bass Tilt' gun fire-control radar (atop a small deckhouse to port on the aft superstructure) has replaced the 'Muff Cob' system on the earlier versions, whilst the space previously occupied by this radar has been taken up by a single 30-mm CIWS. To date 32 'Grisha III' units have been built with a construction rate of about three per year. It is probable that the 'Grisha IIIs' or possibly a further development will eventually replace most of the earlier light frigate classes at present in service with the Soviet navy.

Specification

'Grisha' classes

Displacement: 950 tons standard and 1,200 tons full load

Dimensions: length 72.0 m (236.2 ft) beam 10.0 m (32.8 ft) draught 3.7 m (12.1 ft)

Propulsion: CODAG arrangement with one gas turbine and four diesels delivering power to two shafts

Speed: 30 kts

Armament: one twin launcher for 18 SA-N-4 'Gecko' SAMs, one twin 57-mm AA and ('Grisha III' only) one 30-mm AA CIWS gun, two 12-barrel RBU6000 250-mm (9.84-in) ASW rocket-launchers with 120 rockets, two twin 533-mm (21-in) tubes for anti-

submarine torpedoes, two rails for 12 depth charges, and between 20 and 30 mines according to type

Aircraft: none

Electronics: one 'Strut Curve' air-search radar, one 'Pop Group' SAM fire-control radar, one 'Muff Cob' or ('Grisha III' only) 'Bass Tilt' gun fire-control radar, two 'Watch Dog' ECM systems, one 'High Pole-B' IFF, one medium-frequency hull-mounted sonar, and one high-frequency dipping sonar

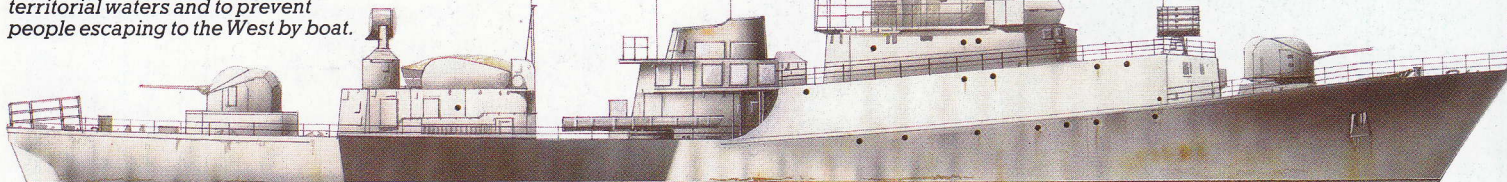
Complement: 80

Right: A 'Grisha I' unit in heavy weather shows that there is no bow sonar dome. There is a hull set and a dipping sonar which is housed in the deckhouse aft beneath the hump-shaped superstructure.



Above: The 'Grisha II' retains the same ASW armament as the Soviet navy units, but has a second twin 57-mm gun forward in place of the SA-N-4 'Gecko' SAM launcher bin system.

The 'Grisha II' class light frigate is used solely by the maritime element of the KGB for protecting Soviet territorial waters and to prevent people escaping to the West by boat.



Soviet ASW Groups in Operation

For many years the Soviet navy has been a predominantly submarine service, but expansion and deployment worldwide have produced more well-balanced fleets, with the ASW function coming much more to the fore.

Control of the oceans, mastery of the seas is as strategically important today as it was when the Greeks destroyed the Persian fleet at the Battle of Salamis in 480 BC; as when Nelson destroyed the French at the Battle of the Nile in 1798 AD; and as when the British empire thrived in large part because of the finest naval and merchant fleets the world had ever seen.

The West have always relied on sea transport for the supply of vital commodities; the USSR has been in the happier position of needing only internal, land-based lines of communication. Warsaw Pact forces can never defeat the West unless it wins control of the seas; the West can never defeat the Warsaw Pact unless it finds the counter to the phenomenal build-up of Soviet naval forces that has taken place since the 1950s.

The architect of the Soviet naval ascendancy, and arguably one of the most far-sighted and brilliant naval officers the modern world has seen, is Admiral of the Fleet Sergei Gorshkov, commander-in-chief of the Soviet navy since 1956. Under Gorshkov the Soviet navy has become the 'senior service' and has made its presence felt throughout the world. This is not for purely defensive reasons, except that attack is the best form of defence. The Soviet strategy is to deny the world's oceans to the West in war and, to a lesser extent, also in peace. It is clear that few things influence or impress a neutral country quite so much as a naval carrier force steaming off its shores.

The Soviet armed forces are predominantly conscript. Within the land-based arms only the Strategic Rocket Forces and special forces are allowed to choose (or reject) conscripts, but the Soviet navy as a whole chooses which young men will serve their three years with it. This is because sea warfare has become an incredibly complicated operation, relying as it does on the most sophisticated electronic techniques imaginable, and that is the case because sea warfare has been revolutionized by the development of the modern submarine. The only weapon system that potentially poses as much of a threat as the submarine on both sides is the satellite 'star wars' system which is in any event years away from final development and deployment. And while NATO and Warsaw Pact land forces face each other, exercising in front of each other across common borders, and while respective air forces continually test each other's defences, submarines continually penetrate or try to penetrate the other side's defences on a daily basis. It is, to all intents and purposes, a war that has been very secretly waged for at least the past 15 years. It is a war, moreover, that is fought largely in unknown and uncharted territory, because the fact remains that man knows more about the topography, conditions, environment and resources of the Moon than he knows about the oceans.

One fact demonstrates the problem. The acoustic detection of submarines depends on the speed of sound in water, and that itself is dependent on temperature and salinity. Both these factors can vary very significantly, not only from ocean to ocean but even within a comparatively small area.

For all its naval might, the Soviet Union suffers from the fact that all of its major

For coastal and inshore ASW the Soviets have a large number of light frigates like the 'Poti' class. These have a minimum of weapons and sensors, but to make up for this they tend to work in hunter-killer teams with support from helicopters and coastal maritime patrol aircraft.



Kiev can act as the command and control unit for ASW hunter-killer groups. She provides the main fighter cover and helicopter ASW capability with her embarked air group of Yak-38 'Forger' VTOL aircraft and Kamov Ka-25 'Hormone' or Ka-27 'Helix' helicopters.

bases (Severomorsk, Kronshtadt, Sevastopol and Vladivostok) are ice bound in winter, and more importantly, are 'hemmed in' by countries either part of, or friendly to, the West. For example, in order that the Baltic Fleet may leave Leningrad and reach the North Sea, it must first pass through the straits controlled by Denmark, Sweden and Norway; and then, to gain access to the Atlantic, it must pass by the UK. In naval strategy these areas are called 'choke points', and every day each side tests the other's ability both to pass through them and to defend them.

It is interesting to look at a Soviet anti-submarine warfare group in operation in the North Sea, where it is not only Soviet submarines that try to pass through the choke points, as NATO submarines are continually probing Soviet defences on a reciprocal basis. The group in all probability consists of a 'Kara' class cruiser accompanied by four 'Krivak' class frigates, all crewed by a majority of conscripted junior ratings; there are more officers and senior petty officers than on a British ship (for example) because Soviet naval officers and petty officers have to do many of the jobs that in the Royal Navy are undertaken by leading ratings and technical seamen. Living conditions for the conscripts are poor by comparison with those of NATO forces. Independence of thought and initiative are not encouraged, meaning that the ship will be an effective fighting force only until the pressure really starts. (In November 1975 a 'Krivak' class frigate tried to defect to Sweden, but was eventually forced back by Soviet ships and aircraft. Though not an everyday occurrence, this is still a good indication of the morale problems that result from such an inflexible system.)

On board the 'Kara' class cruiser is an electronic engineer's dream (or nightmare). Firstly, there is the capability for the input of raw data from sources like satellites, friendly aircraft, other surface ships and the ship's own helicopters; there may also be a friendly submarine feeding back information. Secondly, there is the input provided by interception of 'enemy' transmissions; this can be provided by the ship (and her accompanying sisters) or can be relayed from a





Although having a relatively heavy AA armament, the role of the 'Kresta II' missile cruiser is primarily ASW, for which it carries two quadruple SS-N-14 'Silex' missile launchers for long-distance attacks on enemy submarines.

shore-based intercept facility. Thirdly, there is the input provided by the ship's own fixed detection devices, such as sonar, 'Head Net' air surveillance radar etc. The 'Head Net' radar can be omitted from the ASW reckoning, however, except to make the points that all raw data reaching the ship have to be processed by one or more mainframe computers and that the sheer quantity of data puts a tremendous strain on operator and equipment alike.

What type of information is pouring into the 'Kara' class cruiser and, to a lesser extent, the four 'Krivak' class frigates?

To begin with, the Soviet high command tries to keep tabs on the position of every NATO submarine, particularly those within firing distance of the Soviet Union's most sensitive and strategic area. In theory satellites observe the submarines leaving port, and then attempt to track them through the oceans using infra-red techniques to detect each submarine's heat trail. Hundreds of Soviet spy ships listen for any submarine within their area, and try to identify class if not the boat itself by its distinctive electronic/sonar signature. Static devices littering the sea bed (one area where the West leads the Soviets) are also used to pick up the passing of the submarine. Surface ships, aircraft and land-based intercept stations also listen carefully for any transmissions. At the same time, more raw data about the condition of the sea itself wherever a submarine is thought to be is also processed with a view to reducing the chances of a wrong positive identification resulting from changes in salinity and temperatures.

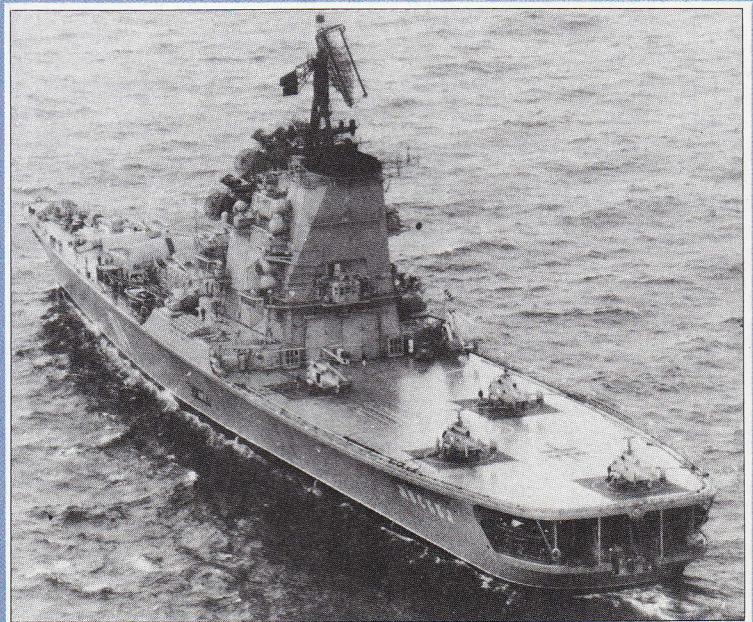
Not every last piece of this data reaches the 'Kara' class cruiser, for some is analysed on shore or by another ship designated for that specific purpose. But the information that does arrive is fed to the mainframe computer, where the data is compared with the data base to provide (if all goes well) the information that there is a submarine in the operational area, where it started, where it is likely to be going and, even, what it is likely to do when it gets there.

Meanwhile, the submarine is not being exactly helpful: it tries initially to remain totally undetected, or lets slip false information if detected. It also uses its electronic countermeasures (ECM) systems to deny and mislead the hunters; and they in turn use electronic counter-counter measures (ECCM) systems to prevent this.

So the captain of the 'Kara' class cruiser has a major problem on his hands, that of management. One must remember that it is not just a matter of detecting the submarine, but also of destroying it or, in time of peace, of going through the drill of destroying it. And as the fire-control systems are also added into the electronic intelligence systems, effective operations call for superb equipment and very highly trained operators. This, as one can readily imagine, puts an enormous strain on officers and senior petty officers, as the majority of the ship's crew are simply button pushers.

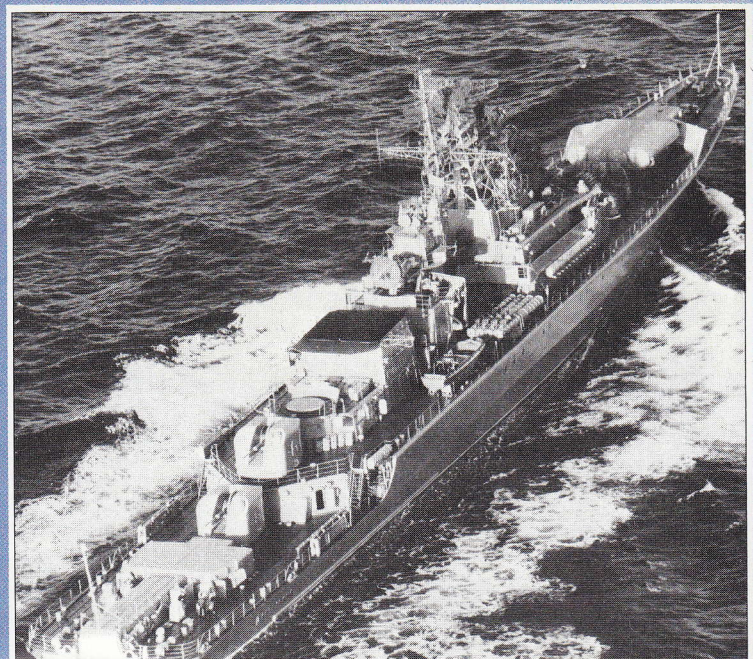
But assuming that the Soviet captain has located a submarine, that the submarine has not done anything so unfriendly as fire its torpedoes (or a missile) at him, or if it has that his ECM systems have managed to deflect them, how will he go in for the kill? The answer is from his own ship, probably using the MBU rocket-launchers (two 16-barrel launchers on the foredeck and two six-barrel launchers aft) or depth charges, or from the accompanying 'Krivak' class frigates, using torpedoes or depth charges. Alternatively the captain can request the aid of one of his own navy's hunter/killer submarines.

But the chances are that the NATO submarine will probably remain undetected in the first place, for the chances of detecting its precise position are very slim indeed. This is probably the reason why so many Soviet ships remain on station (anchored or patrolling) in the North Sea for months at a time, keeping their overall surveillance and detection net as tight as they can. And that probably explains why the crew of an occasional Soviet ship tries to defect en masse; there can be few things more likely to make a person question his loyalties than four months or even a year spent in the North Sea, particularly if you are a conscript earning the princely sum of £50 a year on a ship that allows no alcohol, even on Karl Marx's birthday.



The helicopter cruiser Moskva can command an ASW group. Four of her Kamov ASW helicopters are spotted on take-off and landing areas, which are covered by nets to stop the aircraft slipping in rough seas.

One of the Soviet Baltic Fleet's 'Krivak I' frigates is seen at speed. For ASW operations the modern frigate is equipped with gas turbine propulsion so that it can match the speeds of nuclear submarines for extended periods.



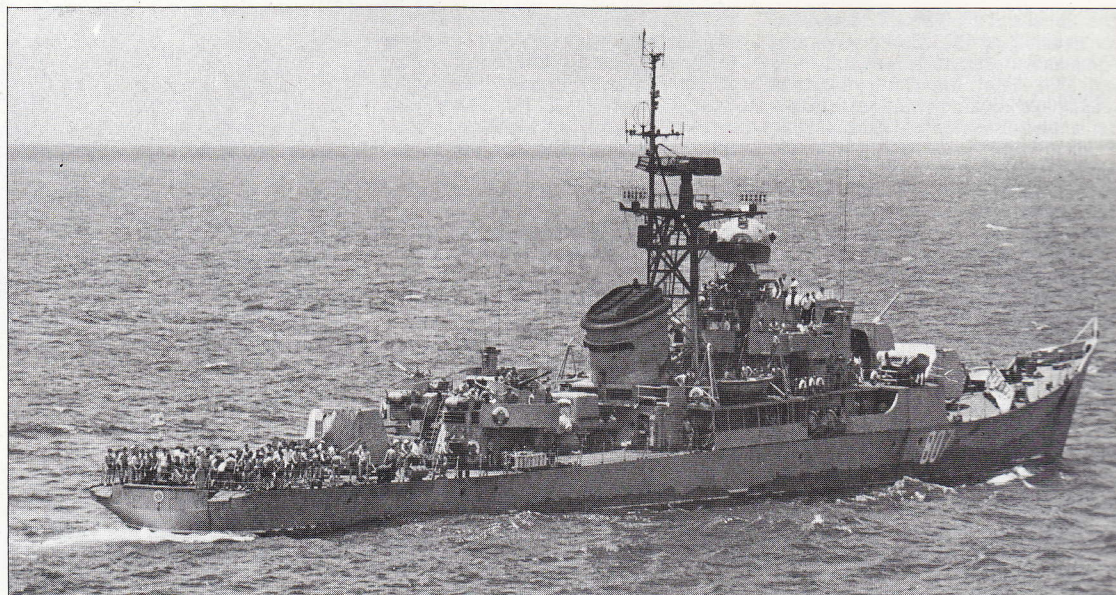


USSR

'Riga' class

Built at the Kaliningrad, Nikolayev and Komsomolsk shipyards in the Soviet Union, the 64 units (including eight for export) of the 'Riga' class were the design successors to the six slightly older 'Kola' class escorts. Always designated *storozhevoy korabl'* (SKR, or patrol ship) by the Soviets, the class has proved to be an excellent coastal-defence design and followed the Soviet practice in the 1950s of building flushdecked hulls with a sharply raised forecastle. Over the years the 'Rigas' have become one of the larger Soviet ship classes, and have been exported in some numbers. In all, 17 were transferred; two to Bulgaria, five to East Germany (of which one was burnt out in an accident soon after being taken over), two to Finland and eight to Indonesia. Most of these units have now been either scrapped or placed in reserve, and China built four further units in her shipyards from components supplied by the Soviets. At present the Soviet navy has some 35 'Rigas' in active service with another 12 in reserve. A small number of the operational vessels were modified during the 1970s, a twin 25-mm AA gun being added on each side of the funnel and a dipping sonar fitted abreast of the bridge. Before this, however, all units were fitted with two hand-loaded 16-barrel RBU2500 ASW rocket-launchers forward to replace the original ASW armament of a single MBU600 'Hedgehog' and four aft-mounted BMB-2 depth-charge throwers. One of the active units was also fitted with a taller stack cap and several 'Bell' series ECM systems, possibly as a trials ship.

Now obsolete, the 'Riga' class remains in service with the Soviet navy in relatively large numbers for second-line duties and as training vessels.



Specification

'Riga' class

Displacement: 1,260 tons standard and 1,510 tons full load

Dimensions: length 91.5 m (300.2 ft); beam 10.1 m (33.1 ft); draught 3.2 m (10.5 ft)

Propulsion: geared steam turbines delivering power to two shafts

Speed: 28 kts

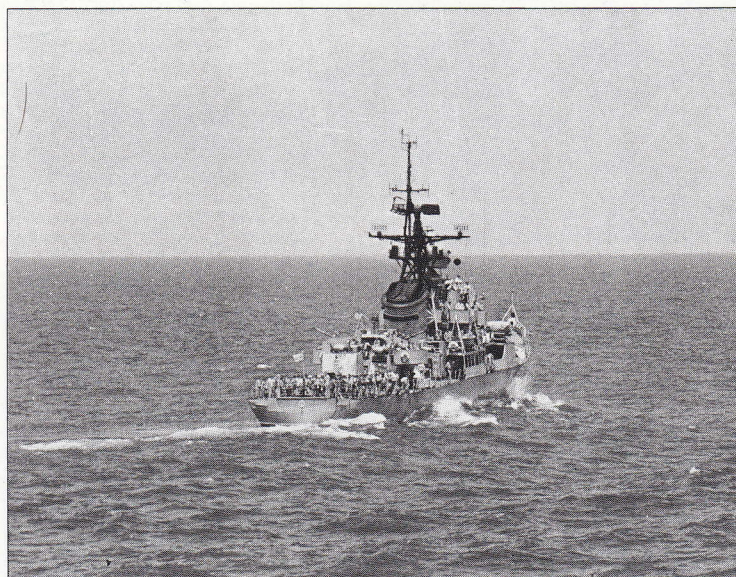
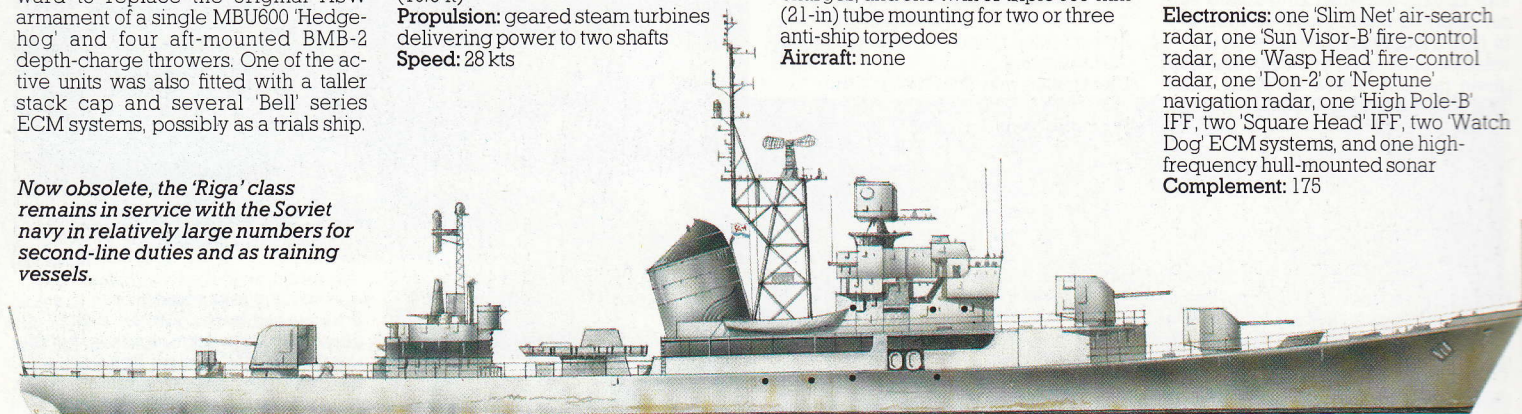
Armament: three single 100-mm (3.9-in) DP, two twin 37-mm AA and (some units) two twin 25-mm AA guns, two 16-barrel RBU2500 250-mm (9.84-in) ASW rocket-launchers with 160 rockets, two racks for 24 depth charges, and one twin or triple 533-mm (21-in) tube mounting for two or three anti-ship torpedoes

Aircraft: none

One of the most popular pastimes practised by the Soviets in warm climates is relaxing on deck away from their spartan living conditions, as the majority of the crew of this 'Riga' class frigate is doing.

Electronics: one 'Slim Net' air-search radar, one 'Sun Visor-B' fire-control radar, one 'Wasp Head' fire-control radar, one 'Don-2' or 'Neptune' navigation radar, one 'High Pole-B' IFF, two 'Square Head' IFF, two 'Watch Dog' ECM systems, and one high-frequency hull-mounted sonar

Complement: 175



Seen during the 'Okean '70' exercise off the Philippines, this 'Riga' class frigate of the Pacific Fleet is still useful in that area because one of the potential adversaries is the similarly equipped navy of the People's Republic of China.



The two Finnish navy 'Riga' class frigates Hameenmaa and Uusimaa lead a group of patrol boats. In 1980 the latter was stricken to provide spares for her sister ship, which was redesignated as a minelayer.

USSR

'Petya' classes

The 18 units of the 'Petya I' class were constructed at the Kaliningrad and Komsomolsk shipyards between 1961 and 1964. From the latter year until 1969 both shipyards switched to building a total of 27 'Petya II' class units, which differed from their predecessors in having an extra quintuple 406-mm (16-in) ASW torpedo tube mounting in place of the two aft ASW rocket-launchers. The two forward-mounted RBU2500 rocket-launchers were also exchanged for the RBU6000 system with automatic loading facilities. Both variants also had mine rails.

From 1973 onwards eight 'Petya I' vessels were modified to give the 'Petya I (Mod)' class. The conversion involved the addition of a medium-frequency variable-depth sonar (VDS) system in a new raised stern deckhouse, which necessitated the removal of the mine rails. A further three units were then converted as trials vessels and given the same sub-group designation: one was fitted with a larger VDS system with no deckhouse at the stern; the second had a deckhouse installed abaft the stack (following the removal of the torpedo tubes) and fitted with a complex reel/winch installation for what may be either a towed non-acoustic ASW sensor or a towed surface-ship sonar array; the third vessel had a small box-like structure built at the stern for a towed sensor deployed from a hole in the stern. In 1978 a single unit of the Petya II type was also converted to a trial vessel and given the title 'Petya II (Mod)' class. The conversion was along the lines of the 'Petya I (Mod)' but with a slimmer VDS deckhouse which allowed retention of the minelaying capability.

In late 1984 the Soviet navy had a total of seven 'Petya I', 11 'Petya I (Mod)' including three trials vessels, 23 'Petya II' and one 'Petya II (Mod)' (for trials) in service with all four fleets. A further three 'Petya II' of the Soviet navy were transferred to Vietnam (two ships) and Ethiopia (one ship), whilst another 18 export ships were speci-

fically built with a triple 533-mm (21-in) torpedo tube mounting and RBU2500 ASW rocket-launchers for the navies of India (12 ships), Vietnam (four ships) and Syria (two ships). The 'Petyas' are currently rated by the Soviets as *storozhevoy korabl'* (SKR, or patrol ship).

Specification

'Petya' classes

Displacement: 950 tons standard and 1,150 tons or ('Petya II') 1,160 tons full load

Dimensions: length 81.8 m (268.4 ft) or ('Petya II') 82.5 m (270.7 ft); beam 9.1 m (29.9 ft); draught 2.9 m (9.5 ft)

Propulsion: CODAG arrangement with two diesels and two gas turbines delivering power to three shafts

Speed: 33 kts

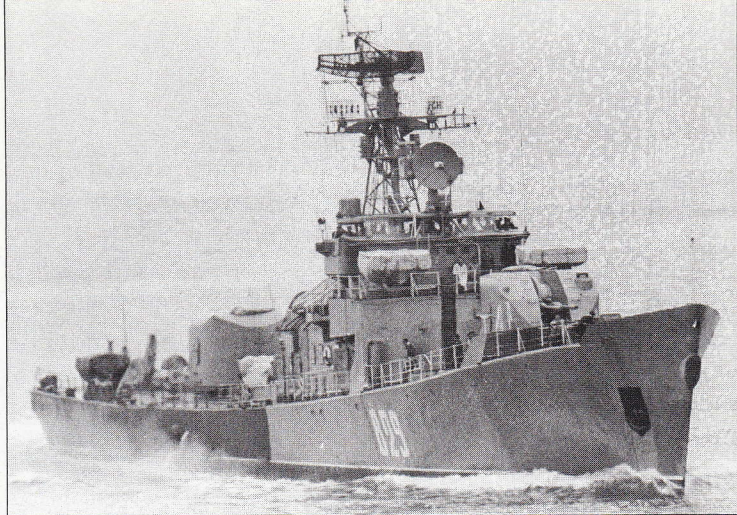
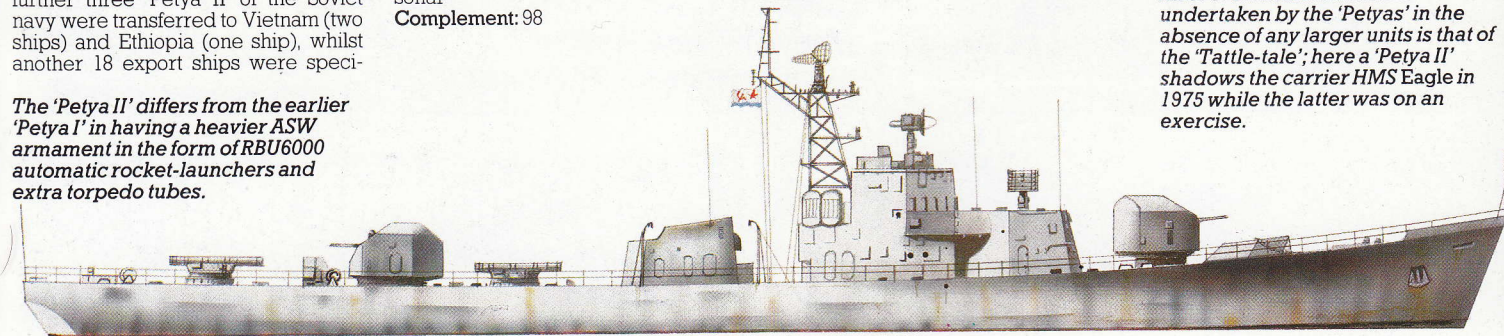
Armament: two ('Petya I (Mod)' towed-array trials ship one) twin 76-mm (3-in) DP guns, four 16-barrel RBU 2500 250-mm (9.84-in) ASW rocket-launchers with 320 rockets or ('Petya II' and 'Petya II (Mod)' only) two 12-barrel RBU6000 250-mm (9.84-in) ASW rocket-launchers with 120 rockets or ('Petya I (Mod)' only) two 16-barrel RBU2500 launchers with 160 rockets, two ('Petya I (Mod)' only) racks for 24 or 12 depth charges, one ('Petya II (Mod)' two and 'Petya I (Mod)' towed-array trials ship none) 533-mm (21-in) quintuple tube mounting for five or 10 anti-submarine torpedoes, and between 20 and 30 mines (none in 'Petya I (Mod)') according to type

Aircraft: none

Electronics: one 'Slim Net' or 'Strut Curve' air-search radar, one 'Hawk Screech' 76-mm gun fire-control radar, one 'Don-2' navigation radar, one 'High Pole-B' and (only in 'Petya I') two 'Square Head' IFF, two 'Watch Dog' ECM systems one high-frequency hull-mounted sonar, one high-frequency dipping sonar, and (in some, see text) one variable-depth sonar

Complement: 98

The 'Petya II' differs from the earlier 'Petya I' in having a heavier ASW armament in the form of RBU6000 automatic rocket-launchers and extra torpedo tubes.



This unmodified member of the 'Petya I' class of light frigates is easily identified by the presence of the RBU2500 ASW rocket-launchers in

front of the bridge and the lack of any stern superstructure for a variable-depth sonar system.



Above: One task sometimes undertaken by the 'Petyas' in the absence of any larger units is that of the 'Tattle-tale'; here a 'Petya II' shadows the carrier HMS Eagle in 1975 while the latter was on an exercise.

USSR

'Mirka' classes

Built between 1964 and 1965 at the Kaliningrad shipyard, the nine 'Mirka I' class vessels were followed on the stocks during the latter half of 1965 and 1966 by nine 'Mirka II' class units. They were constructed as a more specialized variation of the early 'Petya' design and were initially rated by the Soviets as *malyy protivolodochnyy korabl'* (MPK, or small anti-submarine ship). As with some other ASW-oriented ship classes, this was changed in 1978 to *storozhevoy korabl'* (SKR, or patrol ship).

The various vessels of the two 'Mirka' classes serve only with the Soviet Baltic and Black Sea Fleets. The prop-

ulsion plant is similar in concept to the combined diesel and gas turbine plant of the 'Petyas', with a high maximum speed for use in attacks on submerged submarines. The basic difference in the two variants is that the 'Mirka IIs' lack the two aft 250-mm (9.84-in) RBU6000 ASW rocket-launchers of the

The 'Mirka I' and 'Mirka II' units of the Black Sea fleet are regularly deployed to the Mediterranean squadron to provide ASW protection to higher-value surface units and the many deep water anchorages that the Soviet navy has in the region.



'Mirka I' but have instead an additional quintuple ASW torpedo tube mounting for 406-mm (16-in) electric torpedoes fitted between the bridge and the mast. Also, the later 'Mirka II' units have a 'Strut Curve' air-search radar in place of the earlier ships' 'Slim Net' set. Almost all units of both classes have now been fitted with a dipping sonar either instead of the internal depth-charge rack in the port side of the stern or abreast the bridge. This is intended for use in areas like the Baltic where oceanographic conditions for ASW operations are notoriously difficult. The 'Mirka' series is expected to serve on into the early 1990s before replacement.

Specification**'Mirka' classes**

Displacement: 950 tons standard and 1,150 tons full load

Dimensions: 82.4 m (270.3 ft); beam 9.1 m (29.9 ft); draught 3.0 m (9.8 ft)

Propulsion: CODAG arrangement with two diesels and two gas turbines delivering power to two shafts

Speed: 35 kts

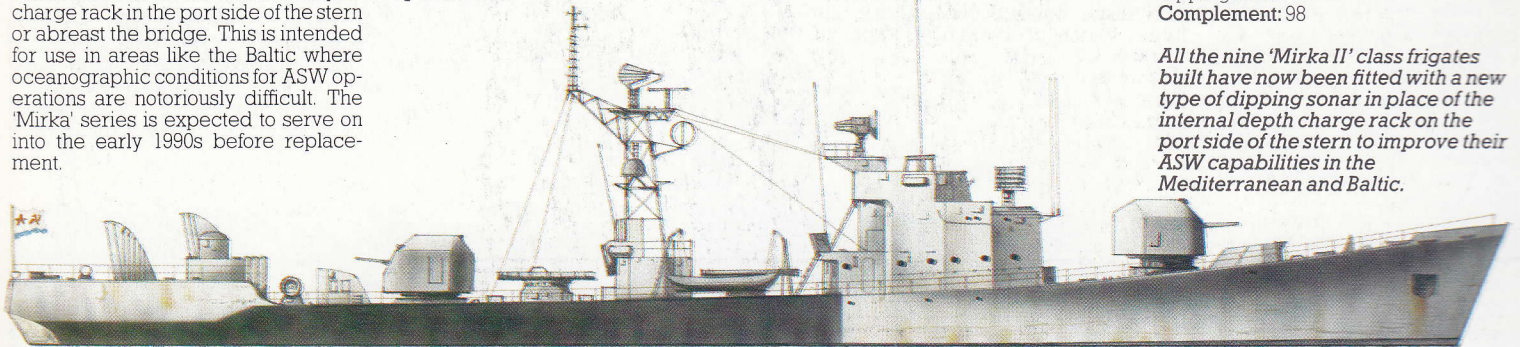
Armament: two twin 76-mm (3-in) DP guns, four ('Mirka I') or two ('Mirka II') 12-barrel RBU6000 250-mm (9.84-in) ASW rocket-launchers with 240 or 120 rockets, and one ('Mirka I') or two ('Mirka II') 533-mm (21-in) quintuple tube mountings for five or 10 anti-submarine torpedoes

Aircraft: none

Electronics: one 'Slim Net' or (some 'Mirka II' only) 'Strut Curve' air-search radar, one 'Hawk Screech' 76-mm gun fire-control radar, one 'Dan-2' navigation radar, two 'High Pole-B' IFF, two 'Square Head' IFF, two 'Watch Dog' ECM systems, one medium-frequency hull-mounted sonar, and (in most units) one high-frequency dipping sonar

Complement: 98

All the nine 'Mirka II' class frigates built have now been fitted with a new type of dipping sonar in place of the internal depth charge rack on the port side of the stern to improve their ASW capabilities in the Mediterranean and Baltic.



USSR

**'Koni' class**

Although constructed in the Soviet Union at the Zelenodolsk Shipyard on the Black Sea, the **'Koni' class** of *storozhevoy korabl'* (SKR, or patrol ship) is intended only for export, a mere one unit, the *Timofey Ul'yantsev*, being retained by the Soviets as a crew training ship for the naval personnel from those countries which have bought vessels of this class. There are two distinct subclasses, the **'Koni Type II' class** differing from the **'Koni Type I' class** in having the space between the funnel and the aft superstructure occupied by an extra deckhouse believed to contain air-conditioning units for use in tropical climates.

The countries which have taken delivery of 'Koni' class units are East Germany (the two Type I's *Rostock* (141) and *Berlin* (142)), Yugoslavia (the two Type I's *Split* (31) and *Koper* (32)), Algeria (the two Type I's *Murat Reis* (901) and *Ras Kelich* (902)), and Cuba (the two Type I's *Mariel* (350) and unnamed (356)). The two Yugoslav units have been further modified by the Yugoslavs themselves to carry two single aft-firing container-launchers for SS-N-2B 'Styx' anti-ship cruise missiles on each side of the superstructure which houses the SA-N-4 'Gecko' SAM launcher-bin assembly. A tenth unit is known to be under construction for export, with more planned. The Type IIs have also had two 16-barrel chaff launchers added to their equipment fit.

beam 12.8 m (42.0 ft); draught 4.2 m (13.8 ft)

Propulsion: CODAG arrangement with one diesel and two gas turbines delivering power to three shafts

Speed: 27 kts

Armament: one twin launcher for 18 SA-N-4 'Gecko' SAMs, two twin 76-mm

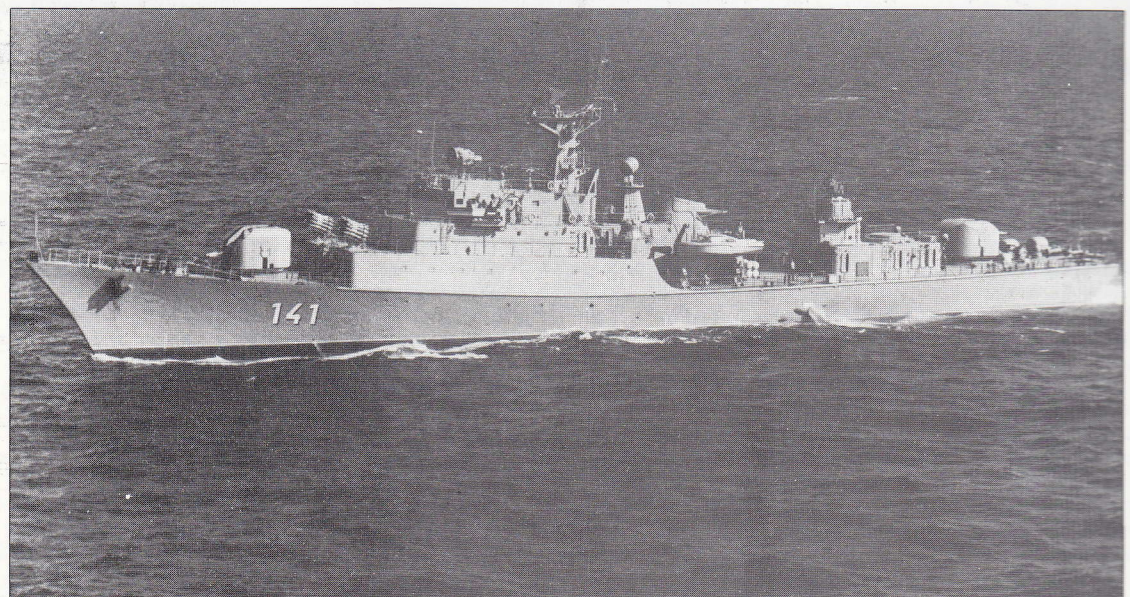
(3-in) DP and two twin 30-mm AA guns, two 12-barrel RBU600 250-mm (9.84-in) ASW rocket-launchers with 120 rockets, two racks for 24 depth charges, and between 20 and 30 mines according to type

Aircraft: none

Electronics: one 'Strut Curve' air-

search radar, one 'Pop Group' SAM fire-control radar, one 'Hawk Screech' 76-mm fire-control radar, one 'Drum Tilt' 30-mm gun fire-control radar, one 'High Pole-B' IFF, two 'Watch Dog' ECM systems, and one medium-frequency hull-mounted sonar

Complement: 110

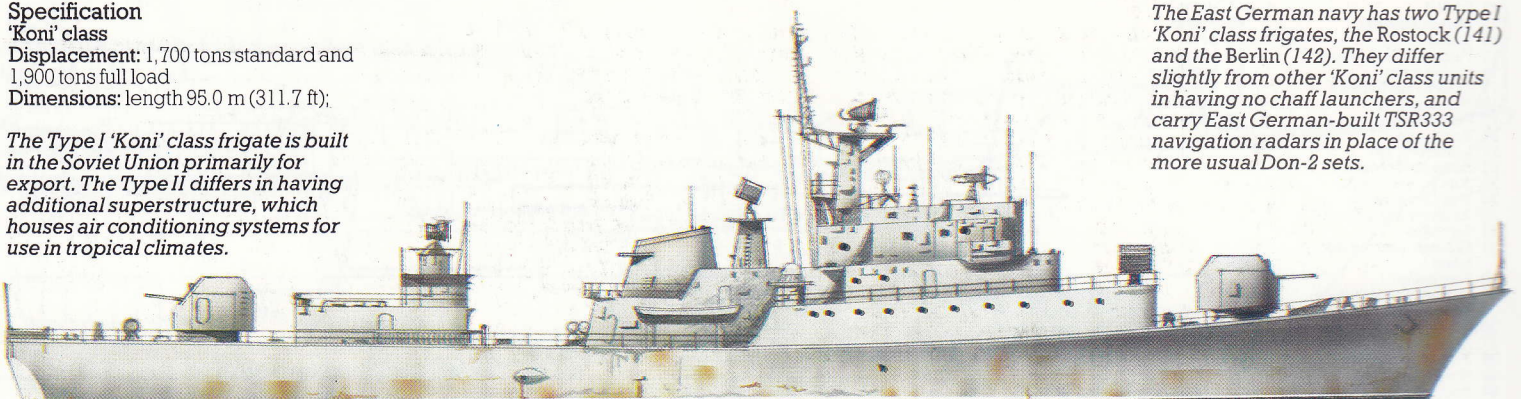
**Specification****'Koni' class**

Displacement: 1,700 tons standard and 1,900 tons full load

Dimensions: length 95.0 m (311.7 ft);

The Type I 'Koni' class frigate is built in the Soviet Union primarily for export. The Type II differs in having additional superstructure, which houses air conditioning systems for use in tropical climates.

The East German navy has two Type I 'Koni' class frigates, the Rostock (141) and the Berlin (142). They differ slightly from other 'Koni' class units in having no chaff launchers, and carry East German-built TSR333 navigation radars in place of the more usual Don-2 sets.



'Krivak' classes

In 1970 the first unit of the gas turbine-powered 'Krivak I' class of *bol'shoy protivolodochnyy korabl'* (BPK, or large anti-submarine ship) entered service with the Soviet navy. Built at the Zhdanov Shipyard in Leningrad, the Kaliningrad Shipyard and the Kamish-Burun Shipyard in Kerch between 1970 and 1982, 21 units of this variant were constructed. In 1976 the 'Krivak II' class, of which 11 were built at Kaliningrad between that year and 1981, was first seen. This differed from the previous class in having single 100-mm (3.9-in) guns substituted for the twin 76-mm (3-in) turrets of the earlier version, and a larger variable-depth sonar housing at the stern. Both classes were re-rated to *storozhevoy korabl'* (SKR, or patrol ship) status in the late 1970s, possibly in view of what some Western observers considered to be the type's deficiencies in terms of size and limited endurance for ASW operations in open waters.

The first unit of the 'Krivak III' class, designed to remedy some of the probable defects, appeared in mid-1984. This has a helicopter hangar and flight deck in place of the aft gun turrets and SA-N-4 'Gecko' SAM launcher, and the forward quadruple SS-N-14 'Silex' ASW missile-launcher is replaced by a single 100-mm DP gun turret. The variable-depth sonar system is retained beneath the flight deck at the stern, whilst single 30-mm ADG630 CIWS are located on each side of the hangar. The other ASW armament of the 'Krivak I/II' classes and the forward SA-N-4 launcher are also retained. The 'Krivak III' is now believed to be in series production at several shipyards as the Soviet navy's new missile frigate for the 1980s.

Specification 'Krivak' classes

Displacement: 3,000 tons standard and 3,700 tons ('Krivak I') or 3,800 tons ('Krivak II') full load

Dimensions: length 123.5 m (405.2 ft); beam 14.0 m (45.9 ft); draught 4.7 m (15.4 ft)

Propulsion: COGAG arrangement with

four gas turbines delivering power to two shafts

Speed: 32 kts

Armament: one quadruple launcher for SS-N-14 'Silex' anti-submarine missiles, two twin launchers for 36 SA-N-4 'Gecko' SAMs, two twin 76-mm (3-in) DP ('Krivak I') or two single 100-mm (3.9-in) DP ('Krivak II') guns, two 12-barrel RBU6000 250-mm (9.84-in) ASW rocket-launchers with 120 rockets, two quadruple 533-mm (21-in) tube mountings for anti-submarine

torpedoes, and between 20 and 40 mines according to type

Aircraft: none

Electronics: one 'Head Net-C' air-search radar, two 'Pop Group' SAM fire-control radars, two 'Eye Bowl' 'Silex' fire-control radars, one 'Owl Screech' ('Krivak I') or 'Kite Screech' ('Krivak II') gun fire-control radar, one 'Don Kay' or 'Palm Frond' navigation radar, two 'Bell Shroud' ECM systems, two 'Bell Squat' ECM systems, four 16-barrel chaff launchers, one 'High Pole-

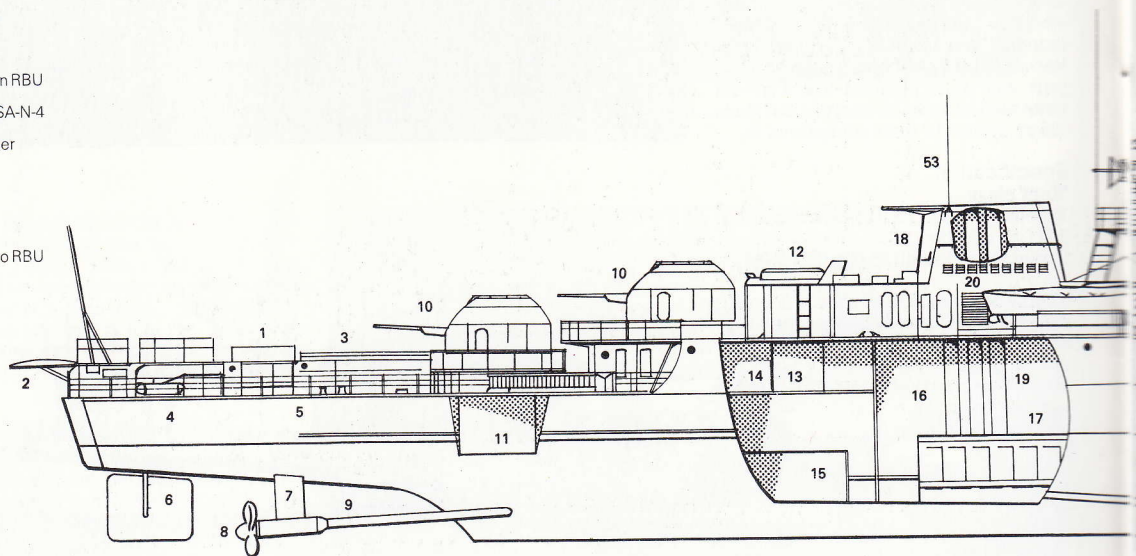
The long rack of the bow with the anchor well forward betrays the presence of a large bow sonar dome for a medium frequency active sonar. For underlayer searching a variable-depth low-frequency sonar system is fitted aft.

B' or 'Salt Pot' IFF, one medium-frequency hull-mounted sonar, and one medium-frequency variable-depth sonar

Complement: 220

Soviet frigate 'Krivak Class II' cutaway drawing key

- | | |
|---|--|
| 1 VDS handling area | 35 Navigation bridge |
| 2 VDS protective door in raised position | 36 Life-saving equipment |
| 3 Control centre for VDS | 37 Control centre |
| 4 Torpedo decoys | 38 Gangway |
| 5 Mine rails set in deck | 39 Officers' quarters |
| 6 Balanced rudder | 40 'Bell Stroud' ECM |
| 7 Screw support | 41 RBU 6000 launcher |
| 8 Double screw | 42 Blast screen between RBU 6000 launchers |
| 9 Shaft | 43 Reload chamber for SA-N-4 |
| 10 100-mm gun | 44 Crew |
| 11 Turntable/ammunition hoist | 45 SS-N-14 quad launcher |
| 12 SA-N-4 | 46 Blast screen |
| 13 Missile stowage | 47 Waterline |
| 14 Stores | 48 Anchor |
| 15 Turbine reduction gear | 49 Sonar |
| 16 Engine room | 50 Magazine |
| 17 COGAG gas turbines | 51 Fuel tanks |
| 18 Funnel casing | 52 Magazine and hoist to RBU launcher |
| 19 Funnel uptakes | 53 Whip aerials |
| 20 Ventilators | |
| 21 Launch | |
| 22 Radar control centre | |
| 23 'Kite Screech' radar | |
| 24 'Pop Group' radar | |
| 25 Air command guidance | |
| 26 Turntable | |
| 27 533-mm quad torpedo tubes | |
| 28 Boat crane | |
| 29 Turntable and machine room for torpedo tubes | |
| 30 Bilge keels | |
| 31 Radio direction finder | |
| 32 'Head Net-C' radar | |
| 33 'Eye Bowl' radar | |
| 34 Bridge | |



'Krivak' in Action

Designed to hunt and kill nuclear submarines in the deep waters of the world's oceans, the 'Krivak' class of frigate is faster and much more heavily armed than Western contemporaries.

When the first 'Krivak I' *bolshoy protivolodochnyy korabl'* (large anti-submarine ship) entered service with the Soviet navy during 1970 it made an immediate impression with Western naval powers, who generally saw the design in a highly impressive light, especially when compared with contemporary Western missile destroyer and frigate designs. Despite the Soviet description of ASW ship, Western observers mistook the type's actual role to be surface strike, with anti-air and anti-submarine weapons embarked only for self-protection. The reason for this misassessment was that the class shipped in a forward position a quadruple container-launcher missile assembly for the same supersonic derivative of the SS-N-2 'Styx' as supposedly carried by the contemporary 'Kresta II' class cruisers and initially allocated the NATO designation SS-N-10. The mistake was finally resolved during the 1970s by Western naval intelligence agencies: the revised designation SS-N-14 'Silex' was adopted as the original and the incorrect SS-N-10 label was simultaneously dropped. One apparent reason for all the confusion was reportedly the result of the Soviets actually sending the 'Kresta II' class to sea without any missiles aboard for several years as the system was undergoing final testing, a brilliant piece of deception which led intelligence services to the wrong conclusions.

No confirmed picture of an SS-N-14 has ever been released to the technical press, but reliable reports indicate that it is in fact a solid-propellant rocket-powered winged cruise missile that conceptually resembles the Australian Ikara ASW missile in dropping a parachute-retarded acoustic-homing torpedo. The maximum and minimum ranges are 55.5 km (34.5 miles) and 7.4 km (4.6 miles) respectively. The maximum range figure means that to ensure the missile's terminal accuracy depend-

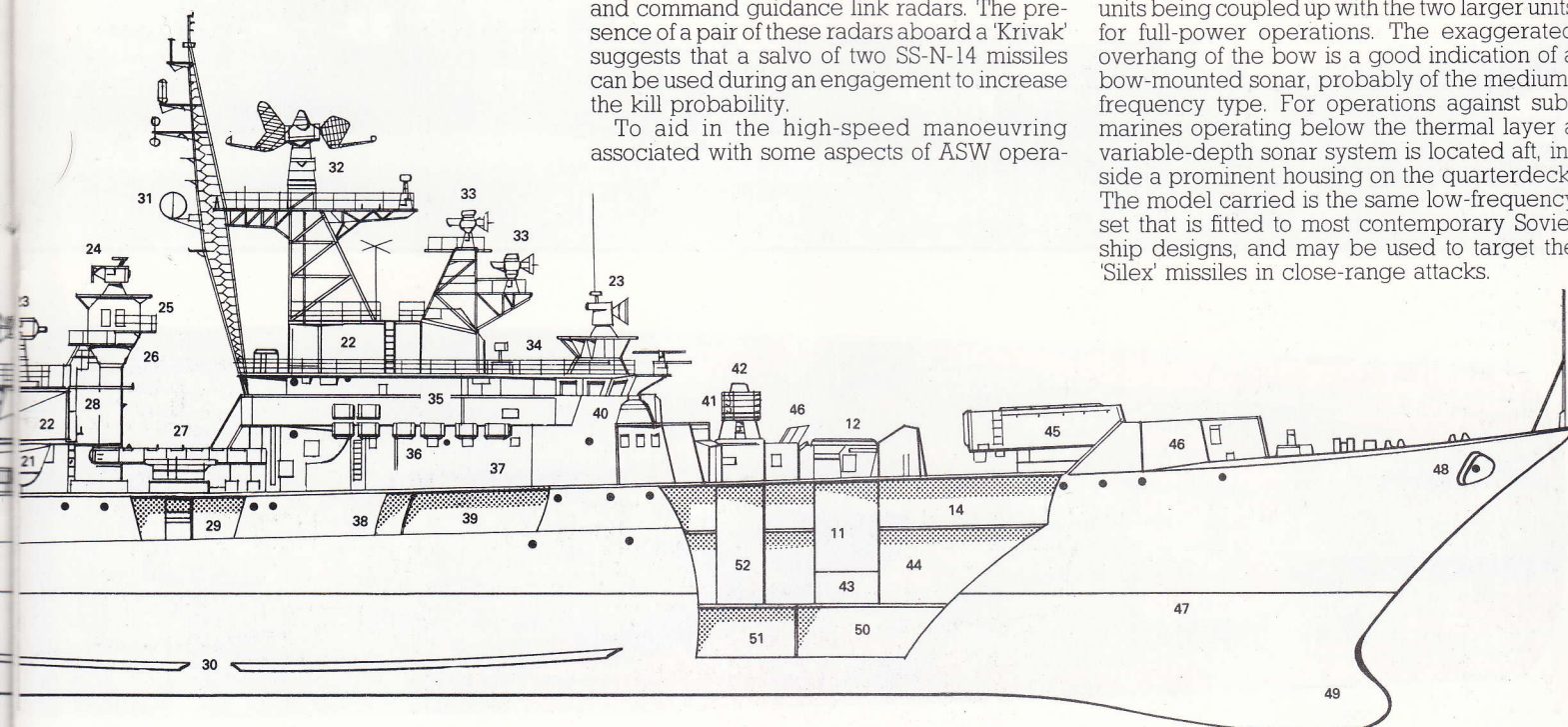


The 'Krivak I' class Soviet frigate Storozhevoy is seen in the English Channel. By the stern housing for the variable depth sonar can be seen the towed decoys that make up part of the BAT-1 acoustic noise making system used against homing torpedoes.

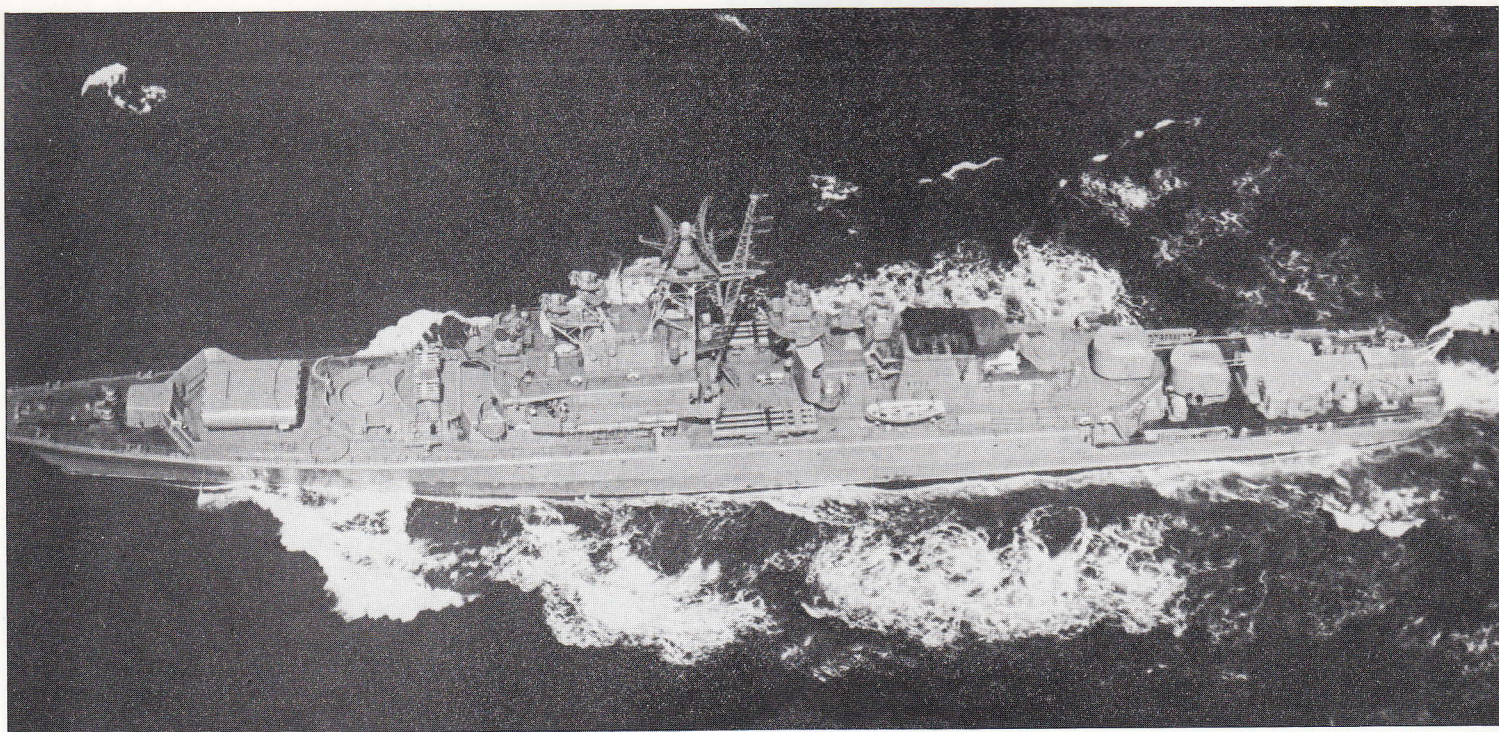
ence is placed not on the ship's own sensors but on a third-party source. This is a capability which fits in well with known Soviet ASW practices: for long-range targets the 'Krivak' is supplied with target position data from other surface ships or airborne platforms via a data-link system after missile launch and early control by the vessel's own 'Eye Bowl' missile tracking and command guidance link radars. The presence of a pair of these radars aboard a 'Krivak' suggests that a salvo of two SS-N-14 missiles can be used during an engagement to increase the kill probability.

To aid in the high-speed manoeuvring associated with some aspects of ASW opera-

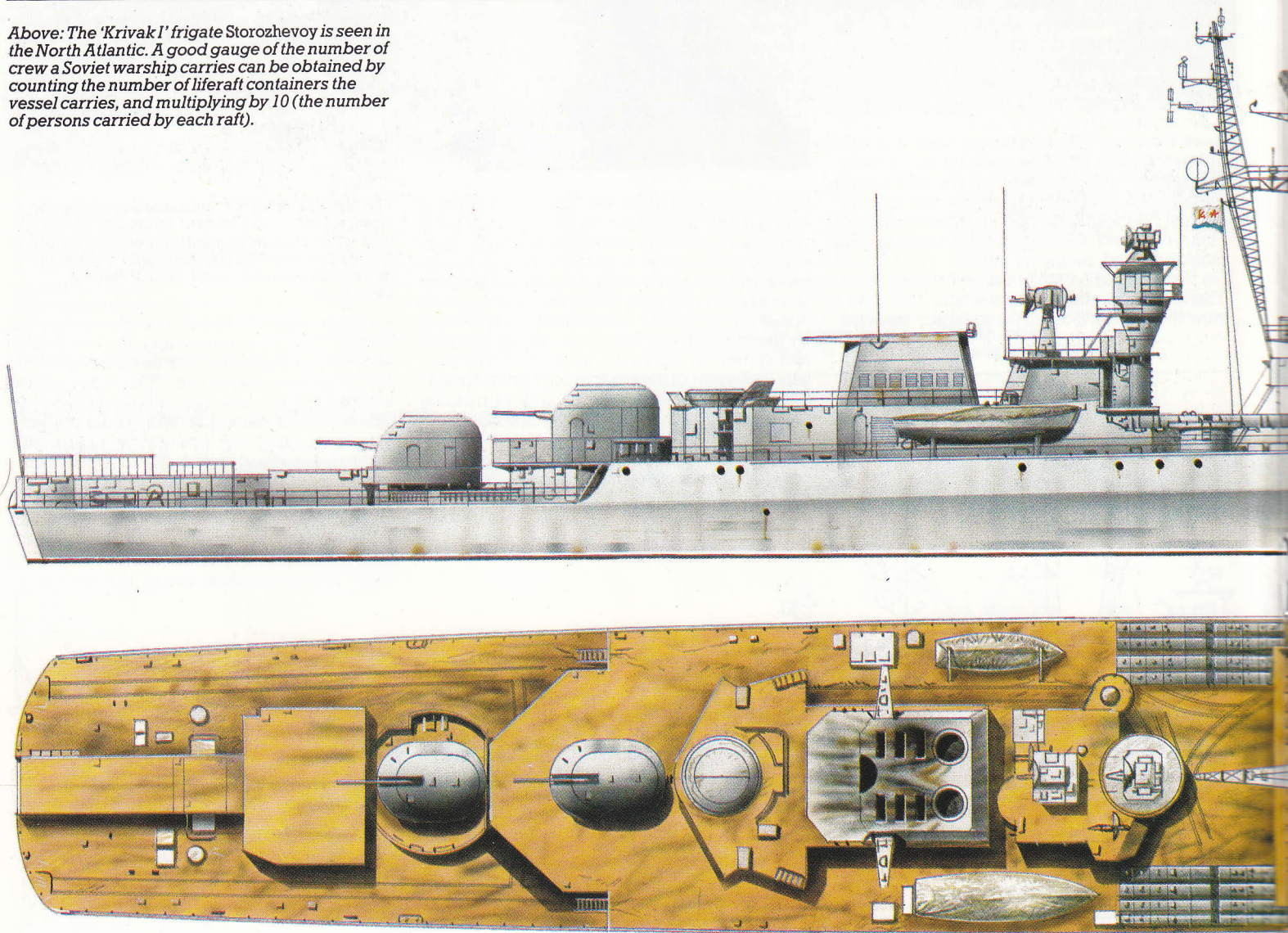
tions the class is fitted with a four-engine gas turbine COGAG arrangement, the two smaller units being coupled up with the two larger units for full-power operations. The exaggerated overhang of the bow is a good indication of a bow-mounted sonar, probably of the medium-frequency type. For operations against submarines operating below the thermal layer a variable-depth sonar system is located aft, inside a prominent housing on the quarterdeck. The model carried is the same low-frequency set that is fitted to most contemporary Soviet ship designs, and may be used to target the 'Silex' missiles in close-range attacks.



'Krivak' in Action

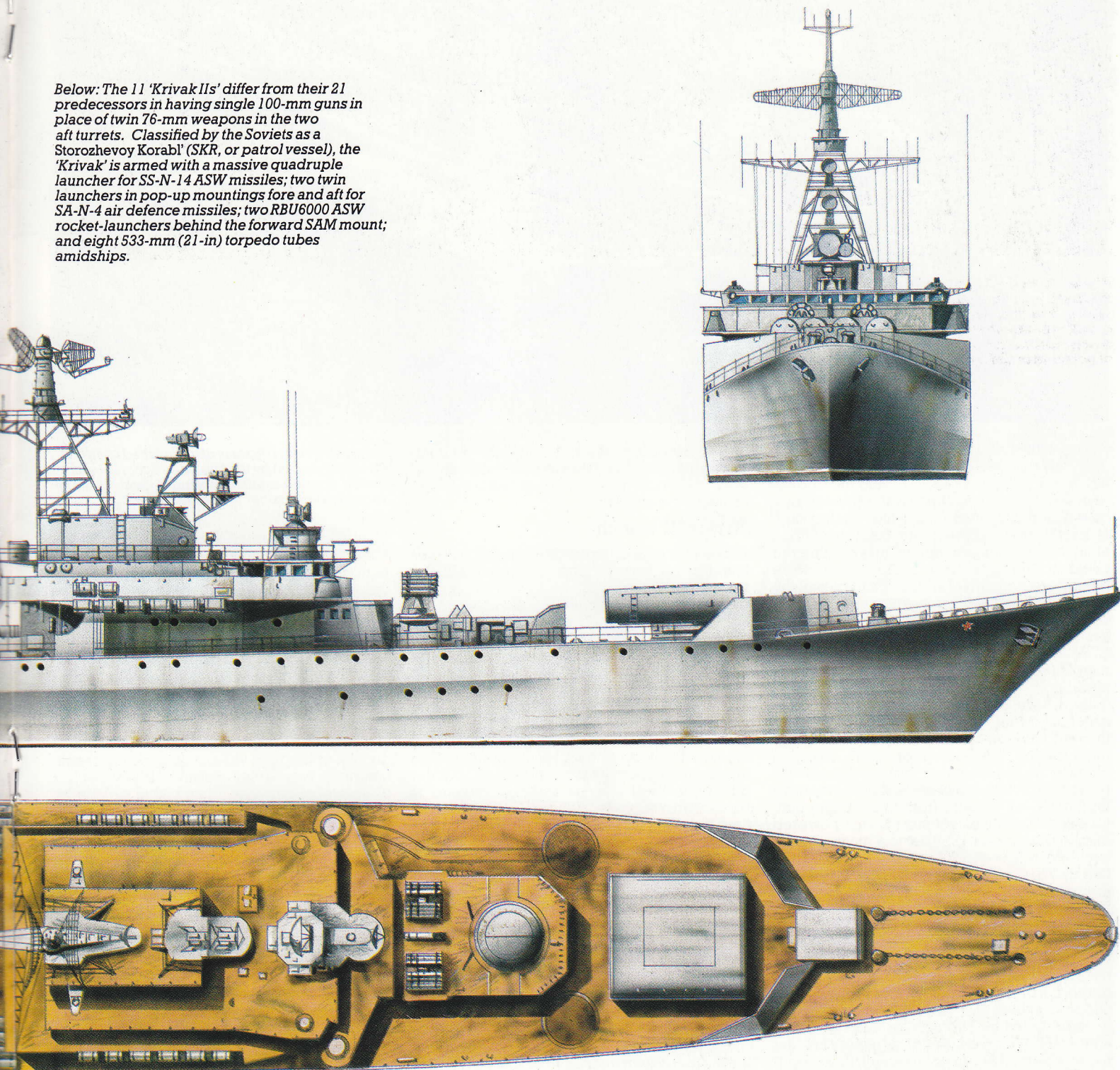


Above: The 'Krivak I' frigate Storozhevoy is seen in the North Atlantic. A good gauge of the number of crew a Soviet warship carries can be obtained by counting the number of liferaft containers the vessel carries, and multiplying by 10 (the number of persons carried by each raft).



'Krivak II' class patrol ship

Below: The 11 'Krivak IIs' differ from their 21 predecessors in having single 100-mm guns in place of twin 76-mm weapons in the two aft turrets. Classified by the Soviets as a Storozhevoy Korabl' (SKR, or patrol vessel), the 'Krivak' is armed with a massive quadruple launcher for SS-N-14 ASW missiles; two twin launchers in pop-up mountings fore and aft for SA-N-4 air defence missiles; two RBU6000 ASW rocket-launchers behind the forward SAM mount; and eight 533-mm (21-in) torpedo tubes amidships.



'Krivak' in Action



The 'Krivak I' was built in tandem with the 'Krivak II' during the mid-1970s and early 1980s. The latter variant differs in having the original twin 76-mm (3-in) gun turrets aft replaced by a new type of fully-automatic water-cooled single-barrel 100-mm (3.9-in) gun capable of firing at up to 80 rounds per minute against either air or surface targets. Only 11 'Krivak IIs' were completed compared with 21 examples of the 'Krivak I' type over the construction cycle of the whole class. Surprisingly, units of both subclasses were completed without their 'Bell' series ECM systems, as a result possibly of the demand of higher-priority shipbuilding programmes.

In 1978 the 'Krivaks' were redesignated *storozhevoy korabl'* (patrol ship). The reason for this may have been either an initial misrating of the type by the Soviets or, more likely, a change in Soviet naval policy during this period. This latter involved a shift of emphasis for surface ASW units, from open-ocean hunter-killer operations against nuclear-powered missile submarines (SSBNs) to a more supportive ASW role in order to secure from interdiction by Western nuclear attack submarines the operating areas of Soviet SSBNs and the transit routes to and from the submarine bases. For this role the 'Krivaks' were ideal, working in neat conjunction with the medium- and short-range shore-based ASW aircraft of the Soviet naval air forces with the aid of information gained from the networks of underwater acoustic arrays that are said to protect the Soviet coastlines. The smaller 'Mirka', 'Petya' and 'Grisha' classes could then perform the more general ASW missions within these 'sani-

tized' areas and support the 'Krivaks' on lengthy search missions, possibly using a centralized command post afloat or ashore to coordinate the sweep.

'Krivak III' launch

The lack of an integral ASW helicopter was found to be very limiting, however, and this resulted in the further revision of the Krivak design to give the 'Krivak III' type, of which the first unit was launched in 1983. This uses the same hull and propulsion plant, but the armament fit has been extensively changed in some areas. The two aft gun turrets have been replaced by a tall and narrow helicopter hangar and flight deck for a single Kamov Ka-25 'Hormone-A' or Ka-27 'Helix-A' ASW helicopter. The variable-depth sonar is retained in a housing now located beneath the flight deck. The minelaying capability is also retained, but the quadruple SS-N-14 Silex launcher forward is replaced by a single 100-mm (3.9-in) DP gun turret. A 'Kite Screech' fire-control radar replaces the 'Eye Bowl' missile-guidance radars. The forward SA-N-4 'Gecko' SAM launcher bin and associated 'Pop Group' fire-control radar remain, but the corresponding aft systems have been deleted and two 30-mm ADG630 CIWS fitted aft on each side of the hangar with the associated 'Bass Tilt' fire-control radar forward of the funnel. The remaining ASW armament of two fully automatic RBU6000 ASW rocket-launchers and the two amidships 533-mm (21-in) torpedo tubes also appear to have been retained.

The transit of the first of this class through the Bosphorus in the autumn of 1984, from the Soviet

A 'Krivak I' class frigate is distinguished from the 'Krivak II' variant by the two twin 76-mm DP gun turrets aft and a smaller housing at the stern for the variable-depth sonar towed body.

Black Sea Fleet via the Suez Canal to the Pacific Fleet, confirms the importance of the new class in future ASW operations in that area. This is indicated by the fact that inter-fleet transfers over the last few years have confirmed the upgrading of the Pacific Fleet's ASW assets from simply a defensive coastal force to one capable of sustaining the new Soviet ASW policy outlined above in all its areas of concern.

It is to be expected that over the next few years the Kaliningrad shipyard, the Zhdanov shipyard at Leningrad, and the Kamish-Bunin shipyard at Kerch, will undertake series production of the new variants as the logical successor to the earlier 'Krivak' classes, with a class total of between 15 and 20 in service by the late 1980s if similar production rates are used. Such a force will endow the Soviet navy with a potent force of ASW vessels that are designed to work in their 'bastion' submarine-operating areas and, working with other classes of smaller ASW units now under construction or in the prototype stage, these will make the task of Western attack submarines more difficult than it is now.

A 'Krivak I' in the English Channel shows the forward twin SA-N-4 'Gecko' SAM launcher installation, the two RBU6000 ASW rocket-launchers and the trainable quadruple SS-N-14 'Silex' ASW missile launcher, together with the two associated 'Eye Bowl' missile guidance radars.



'Nanuchka' classes

Classed by the Soviets as a *malyy raketnyy korabl'* (MRK, or small rocket ship), the 17 units of the 'Nanuchka I' class were built between 1969 and 1974 at Petrovsky, Leningrad with a modified variant, the 'Nanuchka II' class, following at that yard and at an as yet unnamed Pacific coast shipyard from 1977. Now in slow series construction (one per year) the 'Nanuchkas' are considered by Western observers to be coastal missile corvettes, although the fact they are very often seen quite far from home waters (on deployment to such areas as the North Sea, the Mediterranean and the Pacific) tends to put them more in the very light frigate category, especially when the firepower of the class is considered. The anti-ship missile carried is the Mach 0.9 SS-N-9 'Siren', which can be fitted to carry either a 500-kg (1,102-lb) HE or 200-kiloton nuclear warhead over a range of 110 km (68 miles). The SS-N-9 uses a dual active radar and infra-red terminal homing system, with third-party targeting and mid-course corrections to guide it in over the horizon engagements.

In 1977 an export version, the 'Nanuchka II' class was delivered to India. This differs from the standard Soviet models in having twin SS-N-2B 'Styx' SSM launchers in place of the triple SS-N-9 'Siren' launcher systems. India took delivery of three units, Algeria and Libya subsequently receiving three ships each. India is known to have ordered a further three, whilst Algeria and Libya are each due to receive one more unit.

Specification

'Nanuchka' classes

Displacement: 780 tons standard and 900 tons full load

Dimensions: length 59.3 m (194.6 ft); beam 12.6 m (41.3 ft); draught 2.4 m (7.9 ft)

The 'Nanuchka I' class of small missile ship carries the SS-N-9 'Siren' anti-ship missile as its main armament. For maximum range a third-party over-the-horizon targeting source is required.



A 'Nanuchka I' small missile ship underway. The export 'Nanuchka II' class differs mainly in carrying SS-N-

2B 'Styx' missile launchers, whilst the latest Soviet variant, the 'Nanuchka III', has a different gun armament.

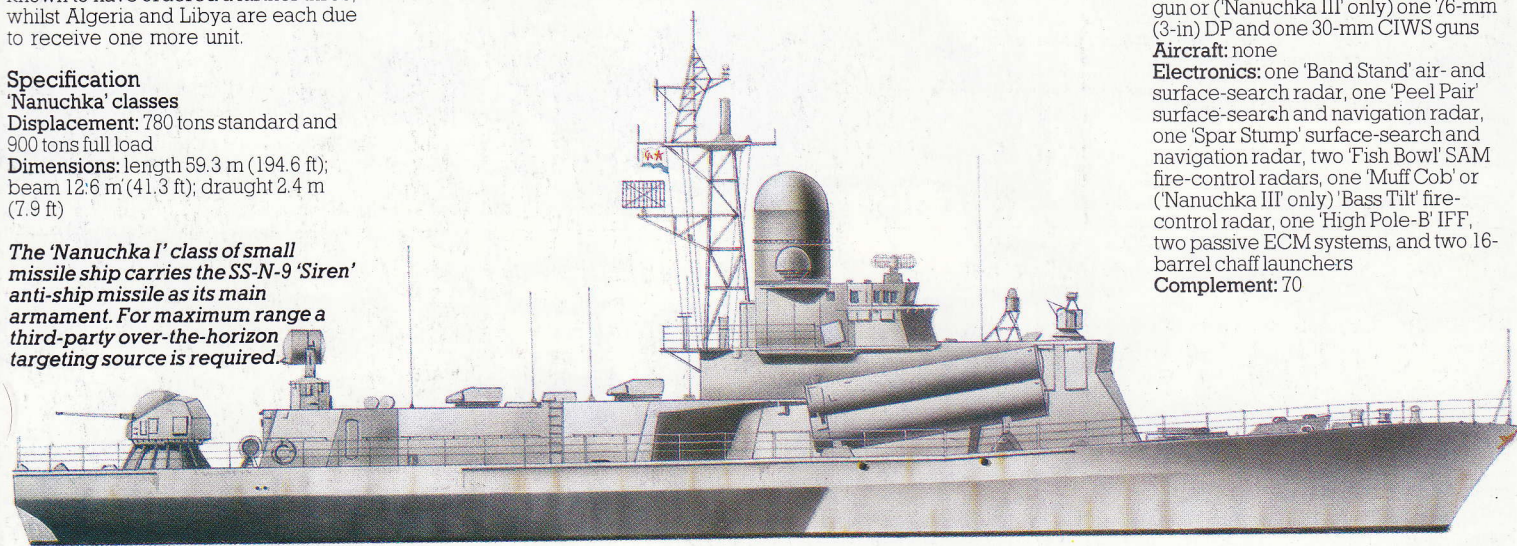
Propulsion: three paired diesels delivering power to three shafts
Speed: 32 kts

Armament: two triple container-launchers for SS-N-9 'Siren' anti-ship missiles, one twin launcher for 18 SA-N-4 'Gecko' SAMs, one twin 57-mm AA gun or ('Nanuchka III' only) one 76-mm (3-in) DP and one 30-mm CIWS guns

Aircraft: none

Electronics: one 'Band Stand' air- and surface-search radar, one 'Peel Pair' surface-search and navigation radar, one 'Spar Stump' surface-search and navigation radar, two 'Fish Bowl' SAM fire-control radars, one 'Muff Cob' or ('Nanuchka III' only) 'Bass Tilt' fire-control radar, one 'High Pole-B' IFF, two passive ECM systems, and two 16-barrel chaff launchers

Complement: 70



'Tarantul' class

Built at Petrovsky, Leningrad, the first 'Tarantul I' class unit was completed in 1978. Like the 'Nanuchka', the class is designated a *malyy raketnyy korabl'* (MRK, or small rocket ship), but its exact place in Soviet naval plans is not yet clear, since in many respects it is not as modern as the 'Nanuchka' class. However, seven 'Tarantul I' units are in service at present, and a production rate of some three ships per year is being sustained. In order to rectify some of the shortcomings of the design the later units of the class have possibly been fitted while building with updated electronics whilst a further unit was completed in 1981 to the 'Tarantul II' class configuration with two twin

over-and-under missile container-launchers for the long-range supersonic SS-N-22 derivative of the SS-N-9 'Siren' in place of the original SS-N-2C 'Styx' system.

One possible explanation for the existence of this design is that it is intended for export, and in fact during 1983 a 'Tarantul I' was transferred to the Polish navy, with more to follow. It is not certain at present whether this first vessel was an ex-Soviet navy unit or new build specifically for transfer. The 'Tarantuls' deploy a modified version of the Soviet navy's small ship armament of a fully automatic 76-mm (3-in) DP gun, capable of 120 rounds per minute, and two 30-mm 6-barrel

Gatling gun mounts that in the Soviet navy have the designation AK-630 (the ADG630 designation often used being a NATO nickname).

Specification

'Tarantul' classes

Displacement: 480 tons standard and 580 tons full load

Dimensions: length 56.0 m (183.7 ft); beam 10.5 m (34.4 ft); draught 2.5 m (8.2 ft)

Propulsion: CODOG arrangements with two diesels and two gas turbines delivering power to two shafts

Speed: 36 kts

Armament: two twin container-launchers for SS-N-2C 'Styx' anti-ship missiles, one quadruple launcher for 16 SA-N-5 'Grail' SAMs, one 76-mm (3-in) DP and two 30-mm CIWS guns

Aircraft: none

Electronics: one 'Band Stand' air- and surface-search radar or 'Plank Shave' surface-search radar, one (not in early units) 'Light Bulb' targeting data system, one 'Spin Trough' navigation radar, one 'Bass Tilt' gun fire-control radar, one 'High Pole-B' IFF, one 'Square Head' IFF, four passive ECM systems, and two 16-barrel chaff launchers

Complement: 50

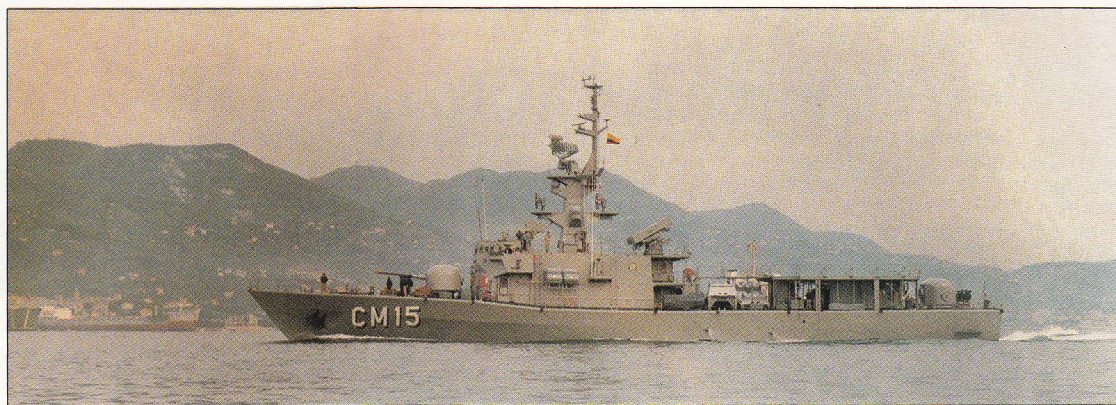


ITALY

'Esmeraldas' class

Although strictly speaking rated as missile corvettes rather than small light frigates, the units of the 'Esmeraldas' class must, because of their multi-purpose capabilities, be ranked with the latter. Ordered in 1978 from the Italian firm CNR del Tirreno, the design is based on the 'Wadi M'ragh (now 'Assad') class for Libya but with more powerful diesel engines, the addition of a helicopter landing platform amidships and a SAM launcher aft of the bridge. All six units of the class, the *Esmeraldas* (CM11), *Manabi* (CM12), *Los Rios* (CM13), *El Oro* (CM14), *Galapagos* (CM15) and *Laja* (CM16) are now in service with the Ecuadorian navy as the country's primary antiship surface strike force. The helicopter platform is used to operate one of the navy's three Aérospatiale Alouette III light helicopters in the surface-search and air-sea-rescue roles as circumstances dictate. The anti-ship missile system fitted is the 65-km (40.4-mile) range MM.40 Exocet, with two banks (each of three single container-launchers, firing outwards) located between the landing platform and the bridge. The SAM system fitted is the lightweight four-round launcher version of the Italian Albatros weapon system which uses the Aspide multi-role missile. Only self-defence ASW torpedo tubes are fitted, together with a hull-mounted sonar set, for sub-surface warfare operations.

Although more correctly classed as a missile corvette, the Ecuadorian navy's 'Esmeraldas' class has more firepower per ship than a number of light frigate classes. They are armed with six MM.40 Exocets, a quadruple Albatros SAM launcher, guns and torpedoes.



Specifications

'Esmeraldas' class

Displacement: 620 tons standard and 685 tons full load

Dimensions: length 62.3 m (204.4 ft); beam 9.3 m (30.5 ft); draught 2.5 (8.2 ft)

Propulsion: four MTU diesels delivering 18195 kW (24,400 hp) to four shafts

Speed: 37 kts

Armament: six single container-launchers for MM.40 Exocet anti-ship missiles, one Albatros quadruple launcher for four Aspide SAMs, one 76-mm (3-in) DP and one twin 40-mm AA gun, and two triple 324-mm (12.76-in) ILAS-3 tube mountings for six

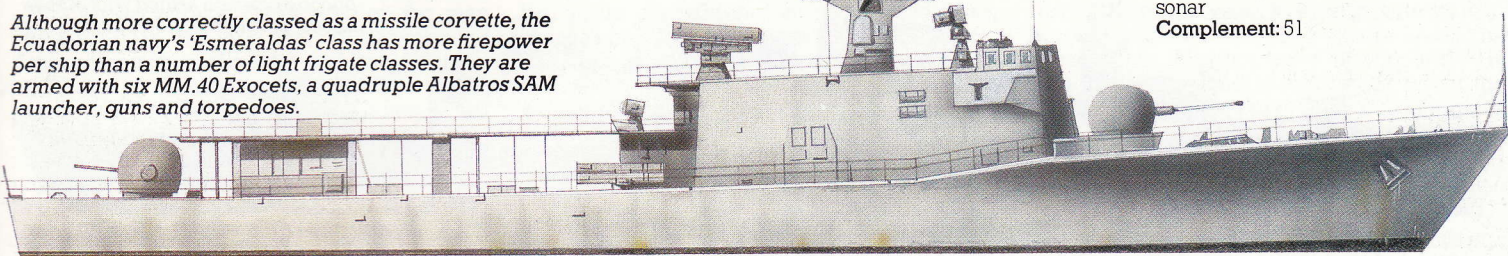
The Galapagos (CM15) is the fifth unit of the 'Esmeraldas' class, built in Italy for Ecuador. The quadruple Albatros SAM launcher behind the bridge superstructure and mast fires the multi-role Aspide missile.

Whitehead A244/S anti-submarine torpedoes

Aircraft: provision for one light helicopter on a landing pad

Electronics: one RANIOS air- and surface-search radar, one Orion 10X fire-control radar, one Orion 20X fire-control radar, one Decca TM1226 navigation radar, one IPN20 data information system, one Gamma ESM system, and one Diodon hull-mounted sonar

Complement: 51



WEST GERMANY/ARGENTINA

'MEKO 140A16' class

As part of the Argentine navy's modernization plans, a contract was signed in October 1980 with the West German firm of Blohm und Voss for six 'MEKO 140A16' class ships, to be built (to a light frigate design based on the Portuguese 'João Coutinho' class) under licence at the AFNE shipyard in Rio Santiago, Ensenada and known locally as the 'Espora' class. The lead ship *Espora* (P4) was commissioned into the Argentine navy in 1983, a trio comprising the *Rosales* (P5), *Spiro* (P6) and *Parker* (P7) following in 1985, with a final pair, the *Robinson* (P8) and *Seaver* (P9), in 1986 and 1987 respectively. The first three differ from the last three units in initially having only a helicopter landing platform amidships,

As part of the Argentine navy's modernization programme in the 1970s, six West German 'MEKO 140' class light frigates were ordered to be licence-built in Argentina. All will eventually be fitted with a hangar facility.

whereas the others are being constructed with a telescopic hangar to allow the permanent carriage of a light helicopter. The earlier units will be retrofitted at the first available opportunity if finances allow.

The Argentines are currently studying a plan whereby in order to cut military expenditure they might well have to sell off some of their new ships. Among the ships being considered is an 'Espora' class unit. The 'Espora' class is replacing some of Argentina's obsolete ex-American World War II destroyers, and its members are equipped predominantly with ASW and anti-surface warfare weapon systems. The four MM.38 Exocet container-launchers shipped aft could be replaced by eight canisters for the lighter but longer-range MM.40 Exocet

which the Argentines use on their 'MEKO 360' type destroyers. Although designed for use primarily on coastal operations, the class forms a potent offensive force for use in any future naval operations against the Falkland islands.

Specification

'MEKO 140A16' class

Displacement: 1,470 tons standard and 1,700 tons full load

Dimensions: length 91.2 m (299.2 ft); beam 12.2 m (40.0 ft); draught 3.3 m (10.8 ft)

Propulsion: two diesels delivering 16853 kW (22,600 hp) to two shafts

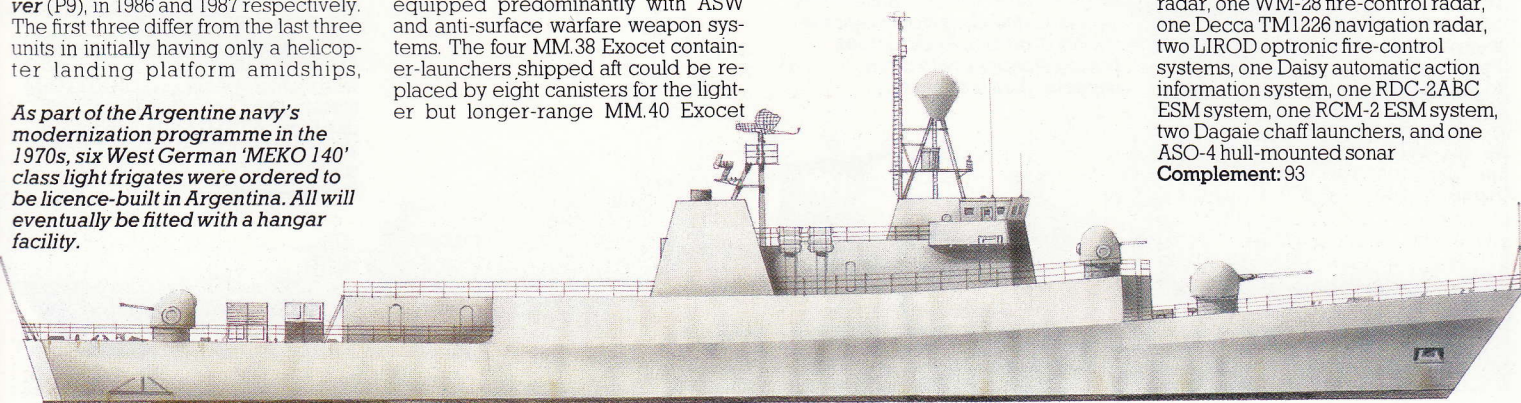
Speed: 27 kts

Armament: four single container-launchers for MM.38 Exocet anti-ship missiles, one 76-mm (3-in) DP and two twin 40-mm AA guns, two single 12.7-mm (0.5-in) machine-guns, and two triple 324-mm (12.76-in) tube mountings for 12 Whitehead A244/S anti-submarine torpedoes

Aircraft: one Aérospatiale Alouette III or Westland Lynx HAS Mk 23 light helicopter

Electronics: one DA-05/2 air-search radar, one WM-28 fire-control radar, one Decca TM1226 navigation radar, two LIROD optronic fire-control systems, one Daisy automatic action information system, one RDC-2ABC ESM system, one RCM-2 ESM system, two Dagaie chaff launchers, and one ASO-4 hull-mounted sonar

Complement: 93





NETHERLANDS/INDONESIA

'Fatahillah' class

The 'Fatahillah' class of Dutch-designed and -built light ASW frigate was ordered in August 1975 as the first major new-build warship type for the Indonesian navy since the acceptance of Soviet ships in the 1950s and 1960s. The class numbers only three, the last unit, the *Nala* (363), differing from her two sisterships, the *Fatahillah* (361) and *Malahayati* (362), in having a new type of helicopter landing deck aft which folds around the MBB BO105 light helicopter carried to form a hangar structure; the other ships have no helicopter facilities at all. The armament and electronics fit was procured from a variety of NATO countries, whilst for service in the hot climates of the Far East the ships are fitted with air-conditioned living spaces. They also have a full nuclear-biological-chemical (NBC) warfare citadel, and have fin stabilizers and a combined diesel or gas turbine (CODOG) propulsion plant arrangement for 'quick-start' operations. The magazines fitted can carry a total of 400 120-mm (4.7-in) and 3,000 40-mm rounds. The main radar fire-control system for the guns is backed by a single LIROD television/laser/infrared optronic fire-control unit.

If present plans are continued, an additional two or three frigates will be bought for the Indonesian navy, but it is

not known if these will be of the 'Fatahillah' class. Moreover, it is not known if they will be procured at all as the Indonesians have bought three reconditioned ex-Royal Navy 'Tribal' class frigates.

The anti-ship missile armament fitted to the 'Fatahillahs' is two pairs of container-launchers for the 42 km (26-mile) range MM.38 Exocet, and this primary armament allows the ships to operate as effective supports for the growing force of missile- and gun-armed attack units which are being procured for use among the myriad islands which make up the Indonesian republic.

Specification 'Fatahillah' class

Displacement: 1,160 tons standard and 1,450 tons full load

Dimensions: length 84.0 m (275.6 ft); beam 11.1 m (36.4 ft); draught 3.3 m (10.8 ft)

Propulsion: CODOG arrangement with one Rolls-Royce Olympus TM3B gas turbine delivering 16674 kW (22,360 shp) and two MTU diesels delivering 5966 kW (8,000 hp) to two shafts

Speed: 30 kts

Armament: four single container-launchers for MM.38 Exocet anti-ship

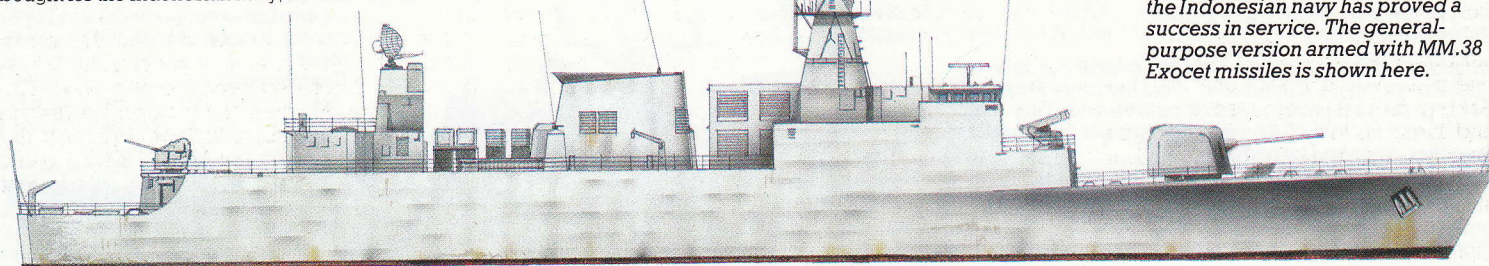
The Indonesian navy 'Fatahillah' class frigate Malahayati (362). If money can be found it is possible that a further batch of these frigates

missiles, one 120-mm (4.7-in) DP, one (two in *Nala*) 40-mm AA and two single 20-mm AA guns, one twin Bofors 375-mm (14.76-in) ASW rocket-launcher with 54 rockets, and (except in *Nala*) two triple 324-mm (12.76-in) Mk 32 tube mountings for 12 Whitehead A244/S or Mk 44 anti-submarine torpedoes

may be built to replace ex-American and Soviet frigate classes which are still in service after some 25 years of use.

Aircraft: (*Nala* only) one MBB BO105 light helicopter
Electronics: one DA-05 air- and surface-search radar, one Decca AC1229 navigation radar, one WM-28 fire-control radar, one LIROD optronic fire-control system, one Daisy automatic action information system, one SUSIE I ESM system, two Corvus chaff launchers, one T Mk 6 torpedo decoy system, and one PHS-32 hull-mounted sonar
Complement: 89

The Dutch-built 'Fatahillah' class for the Indonesian navy has proved a success in service. The general-purpose version armed with MM.38 Exocet missiles is shown here.



FRANCE/SAUDI ARABIA

'Type F2000' class

Ordered from France in October 1980 as a major part of the 14,000 million franc Sawari weapons supply contract, the first of a total of four 'Type F2000' class frigates was laid down in the Arsenal de Lorient shipyard in 1981 and launched in 1983 for commissioning in 1984 as the *Madina* (702). The remaining three vessels are the *Hofuf* (704), *Abha* (706) and *Taif* (708), and were laid down at the CNIM shipyard at Seyne-sur-Mer in 1982-3 for delivery during 1985-6.

The class is a very complex design and uses much untried state-of-the-art electronics technology, and may well be too sophisticated for so young a navy as that of Saudi Arabia. The weapon systems are predominantly French in origin, although the surface-to-surface missiles are the Franco-Italian Otomat Mk 2 rather than the more usual member of the Exocet family, which indicates a long-range anti-ship strike role, especially as the Aérospatiale SA365 Dauphin 2

embarked helicopter will be able to carry out targeting functions.

The presence of the class, in an area of particularly sensitive strategic importance to both major power blocs, will be of considerable interest to all the Arabian Gulf oil states, and the 'Type F2000s' will be matched only by Iraq's Italian 'Lupo' class frigates. A further two large frigates armed with an area-defence SAM system are under consideration, France proposing a 'Type F4000' design equipped with the American single-rail Mk 13

A 'Type F2000' frigate of the Saudi Arabian navy. The purchase of this sophisticated class from France is typical of oil-rich Arab nations buying weapons with more capacity than is necessary.

launcher for Standard SM-1MR missiles and container-launchers for Otomat SSMs. When the Saudis are going to order these vessels is not known at present.

Specification 'Type F2000' class

Displacement: 2,250 tons standard and 2,610 tons full load

Dimensions: length 115.0 m (377.3 ft); beam 12.5 m (41.0 ft); draught 4.7 m (15.4 ft)

Propulsion: four SEMT-Pielstick

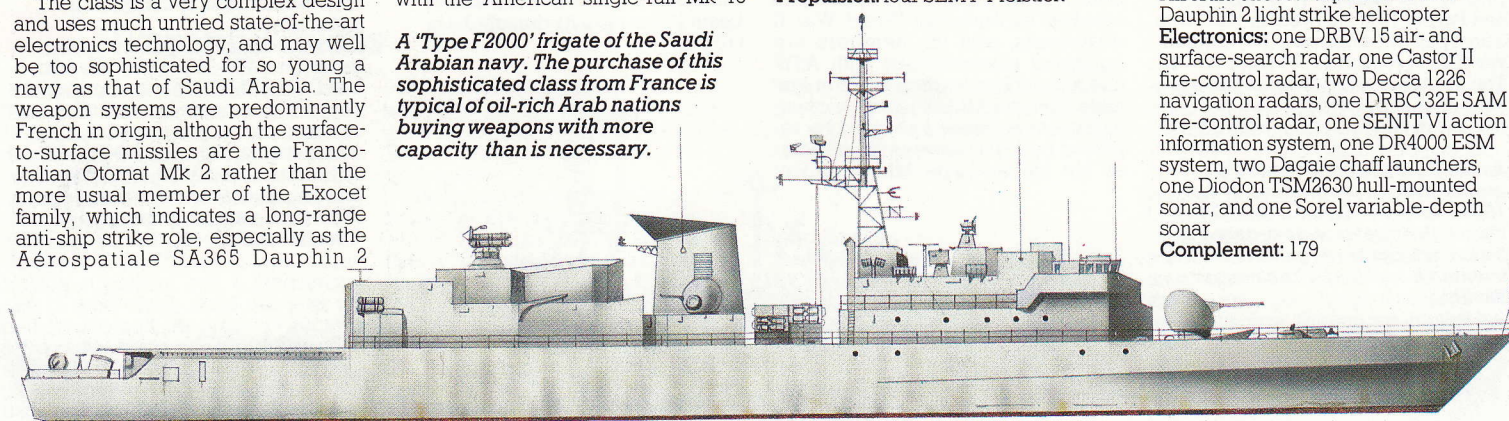
diesels delivering 24235 kW (32,500 hp) to two shafts

Speed: 30 kts

Armament: eight single container-launchers for Otomat Mk 2 anti-ship missiles, one octuple launcher for 26 Crotale Naval SAMs, one 100-mm (3.9-in) DP and two twin 40-mm AA guns, four single 533-mm (21-in) tubes for F17P wire-guided anti-ship and anti-submarine torpedoes, and two single 324-mm (12.76-in) Mk 32 tubes for Mk 46 anti-submarine torpedoes

Aircraft: one Aérospatiale SA 365 Dauphin 2 light strike helicopter
Electronics: one DRBV 15 air- and surface-search radar, one Castor II fire-control radar, two Decca 1226 navigation radars, one DRBC 32E SAM fire-control radar, one SENIT VI action information system, one DR4000 ESM system, two Dagaie chaff launchers, one Diodon TSM2630 hull-mounted sonar, and one Sorel variable-depth sonar

Complement: 179



Middle East Flashpoint: The Gulf

Oil wealth has given the nations of the Middle East the ability to obtain weapons of the most advanced kind. Unfortunately, the volatility of the region is such that the weapons could find themselves in use at almost any time, with grave consequences for the world.

Tension between Iran and her Arab neighbours is not a new phenomenon. It is a tension that goes beyond nations divided by a common religion, although in part it can be traced back to the split in Islam following the death of Mohammed and the subsequent Islamic expansion. It is also a tension founded in cultural antipathies and remembered slights, insults and injuries that go back many hundreds of years. (And before anyone becomes too smug about this, it is worth remembering that the Wars of the Roses are still fought, if only on the cricket field; and that the Hundred Years War is still remembered in continental Europe.)

Before the Ayatollah Khomeini decided to spread his own version of Islamic truth, the Shah dreamed of a Persian empire to rival that of Xerxes, an empire that would, naturally, control (if not include) Saudi Arabia, Iraq, Kuwait, Bahrain, Qatar, the United Arab Emirates and Oman, all countries that just happened to be rich in oil or natural gas.

It was and is a state of affairs that drives cartographers crazy. Depending on the map one considers, that long channel between the Arab peninsula on the west and Iran, Pakistan and India on the east is known either as the Persian Gulf or the Arabic Gulf. Calling it just the 'Gulf' only gets both sides upset. Today, this stretch of water is one of the most strategically important areas in the world: whoever commands it controls the flow of oil from the Middle East. During the Shah's reign there were strong rumours of his intention to occupy and control the Tumbs, islands that guard the entrance to the gulf. But the Shah was then in control of the

most efficient armed forces in the area, and things have changed since Khomeini took over.

Nonetheless, present-day Iranian potential for mischief-making is still enormous. An attempt could be made to attack and control the Tumbs; or to destabilize countries like Bahrain (with a Shia majority), Qatar or even that small Omani enclave at the very tip of the Arab peninsula, occupied by mostly dissident tribesmen and (some say) the Mahdi who caused such trouble to Oman in the 1960s, resulting in the SAS being sent in to help shore up Oman's then fledgling forces. Whatever the circumstances, Iran is still the greatest potential aggressor in the area.

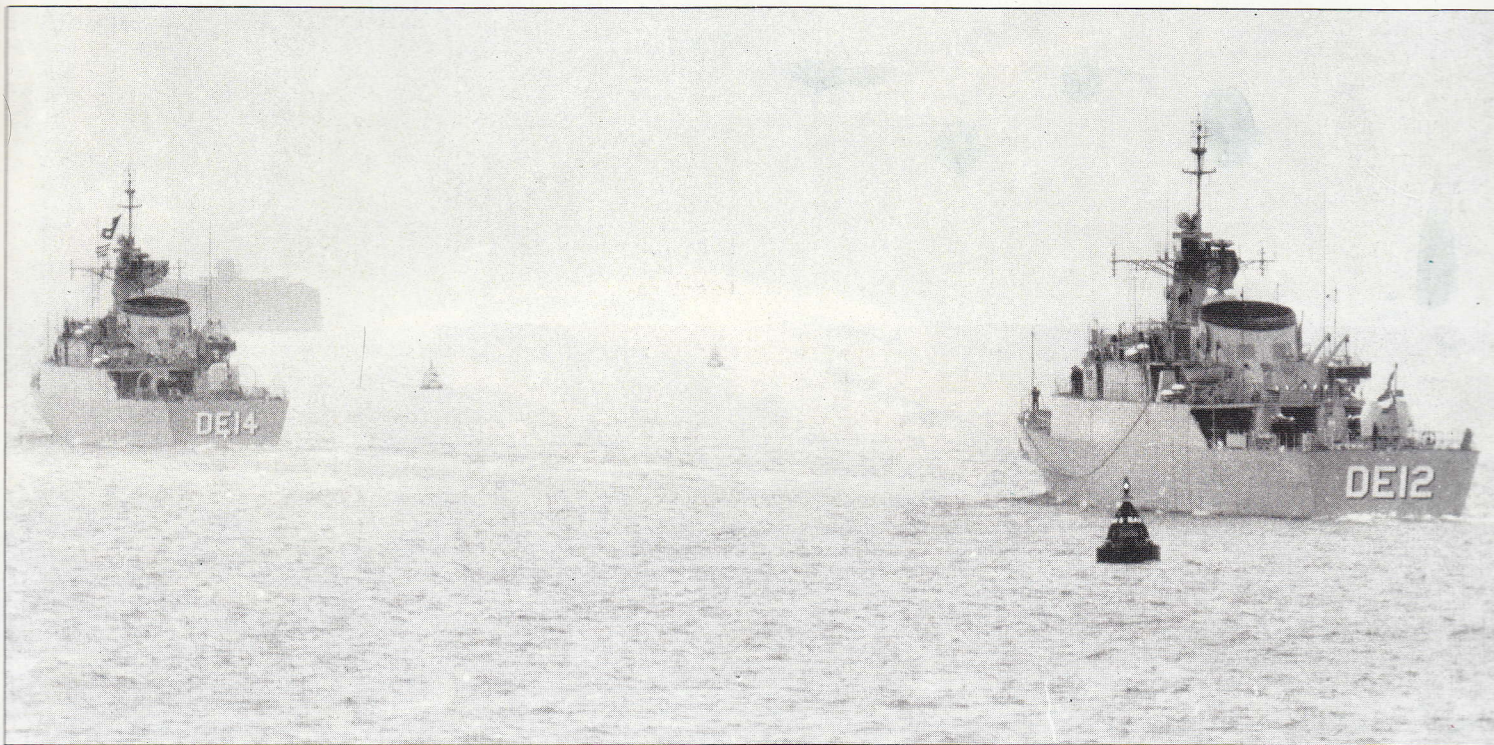
However weakened Iran is by internal dissension and the Iraqi war, she is still viewed with suspicion and outright alarm by her Arab neighbours. And Iran has indeed involved herself in the internal affairs of her neighbours: of that there can be no doubt. She has exported ideological subversion as well as the weapons to back up that subversion. It is thus worth looking at an incident that could have taken place recently or may even take place tomorrow. Incidentally, never expect to see such an incident mentioned in the press: first, even the winners would not want to admit that such an action happened in case it encourages others to try the same ploy with greater success; and second, the losers would be concerned about loss of face, often regarded as being more important than loss of life by politicians the world over.

American satellite intelligence has shown a slight build-up of Iranian naval forces at

Bushehr. Movement to Bushehr has been at night, but that could be as much to avoid Iraqi Exocets as anything else. There may be a totally innocuous reason for the move, and the naval force seems to be not very large. For that matter the present-day Iranian navy is not very large, having shrunk from 20,000 to 10,000 men as a result of the revolution. Pre-revolution Iran possessed three destroyers, four frigates, four corvettes, nine fast attack craft (missile) and seven large patrol craft. How many are left, and of those how many are operational, is anybody's guess. Nonetheless, satellite coverage identifies one combat stores ship (she has to be the *Bandar Abbas*), one replenishment oiler, one guided-missile destroyer and one large patrol craft. American and British naval forces in the area are warned, as are the Omanis, who can be trusted not to panic. The problem lies in the fact that if the Iranians attempt to take over the entrance to the Gulf, the UK, USA and Oman can and will act unilaterally, but that if an attempt is made to land or attack one of the Arab countries, the three nations have to wait until asked. And above and beyond this, no one can blow a few Iranian ships out of the high seas just because they feel threatened: it gives people a wonderful reason to make nasty speeches in the United Nations, as well as giving other countries a reason to do the same thing themselves, with results that all know and rightly fear.

The decision is made that the American AWACS aircraft based in Riyadh in Saudi Arabia will increase coverage in the area. The Royal Saudi Arabian navy headquarters in Riyadh is also alerted; as luck would have it, the first of the Saudis' four new 'Type F2000' frigates from France is visiting Dammam on the east coast, just north of Bahrain.

Without any native industrial capacity, large weapon systems such as the Iranian 'Saam' class and the Saudi 'Madina' class have to be bought elsewhere. Thus the Gulf could see allied weapons on opposing sides.



Middle East Flashpoint: The Gulf

Shortly after sundown, an AWACS aircraft picks up other maritime movement on its Westinghouse AN/APY-1 radar, which can spot maritime targets at long range from its high-altitude patrol orbit. The information that this AWACS aircraft picks up is disturbing in the extreme: four more patrol craft or fast attack craft have appeared from the inlets and secret bays that make up the Iranian coastline. They are identified as naval ships because they are too fast to be the dhows that smuggle embargoed goods into Iran. Nonetheless, it could be

that one highly-placed non-Iranian smuggler has bought himself some war-surplus equipment, so the AWACS command does what it always does in these circumstances and checks with the coastguard and frontier police of Saudi Arabia and other Gulf states to see if a highly-placed smuggler is expecting a shipment. (And one has to be really highly placed to get that sort of treatment: usually it happens only when liquor convoys are detected driving across the desert.)

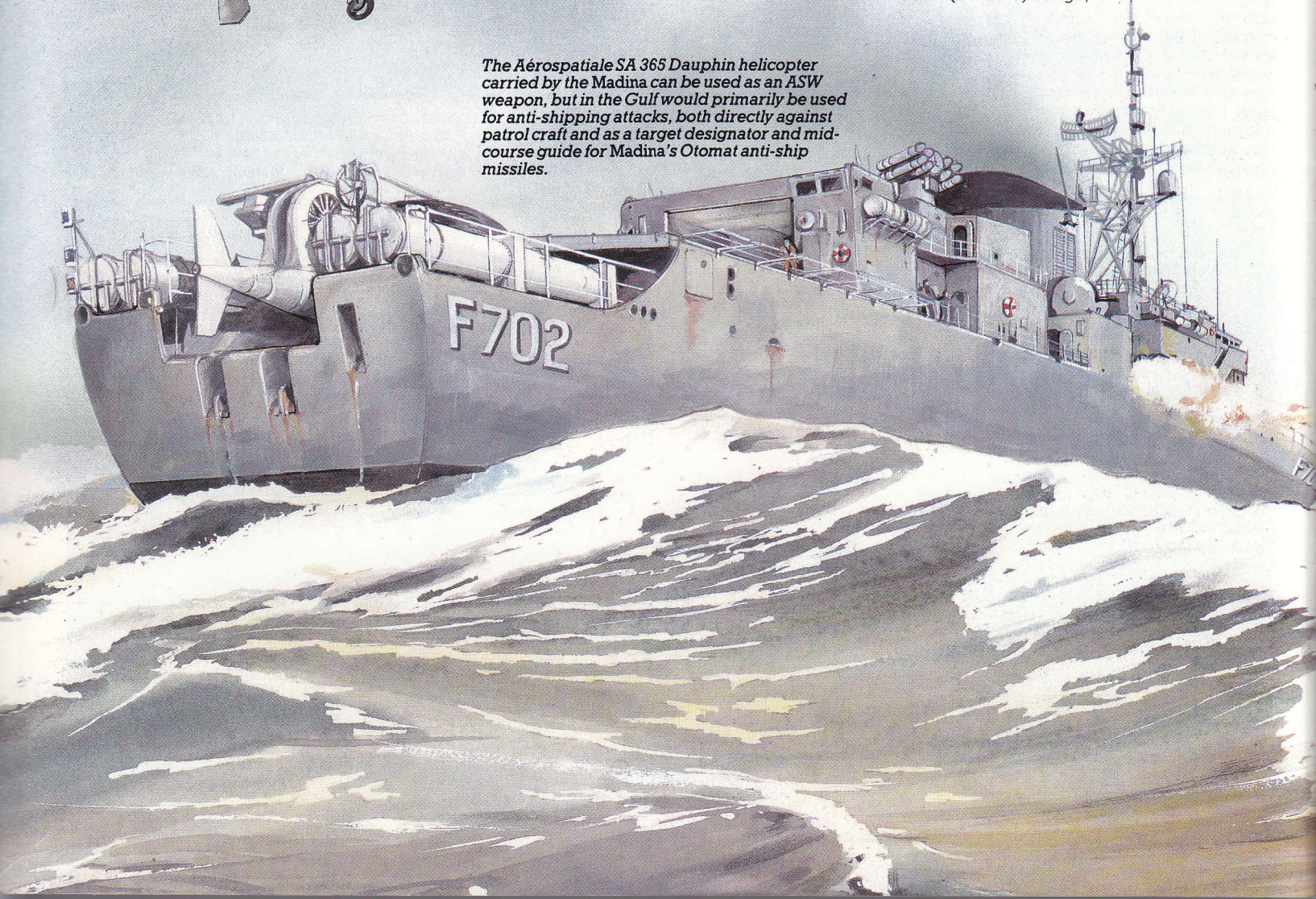
The answer is negative: no 'illegal' shipments are expected. The four new Iranian ships are steaming to join up at a point some 15 km (9.3 miles) south of Bushehr, and satellite IR surveillance now confirms that the Iranian ships in Bushehr have started their engines and are leaving port.

Although there are American and British ships in the area, it is decided to leave it to the Saudis in the first instance, and this means that their new 'Type F2000' frigate, the *Madina*, will

be used. The decision is made somewhat reluctantly because the Saudi navy is still building up its strength and, more importantly, personnel. The problem is that the Saudis have one 'Type F2000' frigate (with three more building), four corvettes, nine fast attack craft (missile), three fast attack craft (torpedo), 39 patrol craft, four coastal minesweepers, 16 landing craft, one tanker (with one more building), and 24 hydrofoils or air-cushion vehicles, but only 4,500 officers and men. Admittedly many of those craft are used by the coastguard and frontier police, and some are even used by the National Guard which Prince Abdullah has built up to be an extremely efficient (internal?) fighting force. Still, there are plainly not enough trained personnel to go round and the Saudis are obviously reluctant to lose the ones they have. But the 'Type F2000' (suitably reinforced) should tip the balance on their side if a naval engagement does take place, because it is a very formidable weapon indeed.

The *Madina* was built by Lorient (DTCN), launched 23 April 1983 and commissioned in 1984. She displaces 2,610 tons at full load, has a top speed of 30 kts and can steam for 12000 km (7,455 miles) at 15 kts. She carries a crew of 179 (15 officers and 164 ratings), plus one Aérospatiale SA 365 Dauphin 2 helicopter. She is armed with 26 Crotale Naval solid-propellant IR-command SAM missiles that deliver 15 kg (33 lb) of HE on target; eight Otomat Mk 2 turbojet-powered radar-homing SSM missiles that deliver 60 kg (132 lb) of HE to 60 km (37.3 miles); one 100-mm (3.9-in) Creusot Loire gun that fires at 60 rounds per minute and has a 13-km (8.1-mile) range; four 40-mm Bofors in

The Aérospatiale SA 365 Dauphin helicopter carried by the Madina can be used as an ASW weapon, but in the Gulf would primarily be used for anti-shipping attacks, both directly against patrol craft and as a target designator and mid-course guide for Madina's Otomat anti-ship missiles.



two twin Breda mountings that fire 320 rounds per minute and (radar-controlled) can knock out an incoming Exocet; four torpedo tubes aft for F17P dual-role torpedoes; and two other tubes, also aft, for Mk 46 anti-submarine torpedoes. She is, as the French would say, *formidable*!

Her fire-control systems would also be supplemented by equipment of the overflying AWACS platform.

The *Madina* will be reinforced by one 'Skorpion' class coastal patrol craft detached from Ras Tanurah and two 'Jaguar' class fast attack craft (torpedo) from Dammam.

By the time the Saudi forces have left port and rendezvoused, all the Iranian forces have met up and are steaming down the Gulf on a course to take them to Ras al Khaima, northernmost emirate in the UAE, but because of the curious bend of the coastline, also the emirate closest to the entrance of the gulf. The Iranian ships are making about 15 kts which will give them plenty of time to swing south east and attack, threaten or pay a courtesy call on any of the Gulf states, or any of the oil rigs that dot that stretch of water.

The Iranian frigate has been tentatively identified as the *Saam*, British-built and commissioned in 1971, then refitted in Devonport in 1977 when her 114-mm (4.5-in) Vickers Mk 7 gun mounting was replaced by the Mk 8 (range 22 km/13.7 miles and rate of fire 25 rounds per minute). In addition she carries two twin 35-mm Oerlikons, five OTO Melara Sea Killer SSMs that deliver a 70-kg (154-lb) HE warhead over 25 km (15.5 miles) and nine Seacat SAMs with a range of 5.9 km (3.7 miles). It is perhaps more accurate to say that this was the armament carried in the time of the Shah: no one really knows what she has now, but it is unlikely to be anything in the same league as the armament carried by the *Madina*. She can in theory steam faster than the *Madina* (39 kts), but the replenishment oiler accompanying her has a top speed of only 21.5 kts. The replenishment oiler (almost certainly the *Kharg*, built by Swan Hunter) also should be carrying three helicopters which may have been fitted with anti-ship torpedoes or missiles. It sounds unlikely that a

replenishment oiler would be used in an attacking role, but when you have most of your navy put out of action by Iraqi Exocets and your own Islamic Courts of Justice, you do not have all that much choice. The combat stores ship (almost certainly the *Bandar Abbas*) is more of a worry for the combat stores she may have on board than for her armament.

General warning

At this point, the Saudi naval HQ issues a general warning to all shipping that 'certain elements' of the Royal Saudi Arabian navy will be conducting an exercise off the Saudi Arabian coast, and that as this exercise may include live firing, it would be advisable to all ships to contact the Saudi Arabian coastguard with their position at regular intervals.

This message is repeated frequently in Arabic, English, Urdu and Farsi, the last being the language of Iran just in case they missed the point, plus English and Urdu because English is the lingua franca of the high seas, and Urdu is spoken universally by local traders. No one wants the Iranians to think that they are being picked on or even warned off, because if the Iranians do think that they are being warned off, it may just trigger them into doing something precipitate. But if the Iranian intentions are honourable (or at least not that aggressive) the mere threat of live firing will cause them to keep away, mainly because the last time there was a live firing exercise (admittedly by the army) in 1984, a Gulf Air passenger jet was blown out of the sky.

By now it is 04.30 and dawn is beginning to break. And as it does, the Iranian squadron turns directly to the Arabic coastline and increases speed to 20 kts.

Simultaneously, a wave of bombing breaks out in Bahrain and Kuwait and the Qatari radio stations goes off the air. Now the bombing could be the work of Palestinians, or Libyan-inspired terrorists; the Qatari radio station could have suffered a breakdown, or there could be yet another attempted palace coup. Unfortunately, the Saudi task force cannot afford to take the time to find out. It alters course to intercept the Iranian force; all maritime frequencies are now confirming that live firing will take place, and that all ships should stay well clear, at least for the next few hours or so.

Leading the Saudis is the 'Skorpion' coastal

patrol craft, number 144. As she gets within range of the Iranians, she tries to raise them on ship-to-ship radio, but to no avail. But what number 144 does get is a couple of Sea Killer missiles that come skimming across the waves towards her. Number 144 does not have a chance. At this point the Iranians finally break radio silence to announce on open channels that they are under attack by unidentified surface ships, believed to be American and that they are fighting back bravely in the face of this wicked aggression. And this is where the *Madina* comes into action.

The decision has been made in Riyadh to avoid sinking the *Saam* if possible, because such an important loss could trigger off a major confrontation, if not war. The idea is to teach the Iranians a lesson without causing them too much loss of face. Four Otomat Mk 2 surface-to-surface missiles are fired, two each at the *Bandar Abbas* and the *Kharg*. There are two direct hits, and one combat stores ship and one fleet replenishment oiler explode. Simultaneously the *Madina* has been warning, via radio, that two unidentified craft have strayed into the missile test firing area and are under considerable risk.

The message strikes home, and the remaining Iranian ships turn back, still shadowed by the AWACS aircraft.

The Saudi task force stays at sea a little longer (it is, after all, on exercise) before it too returns to its home ports.

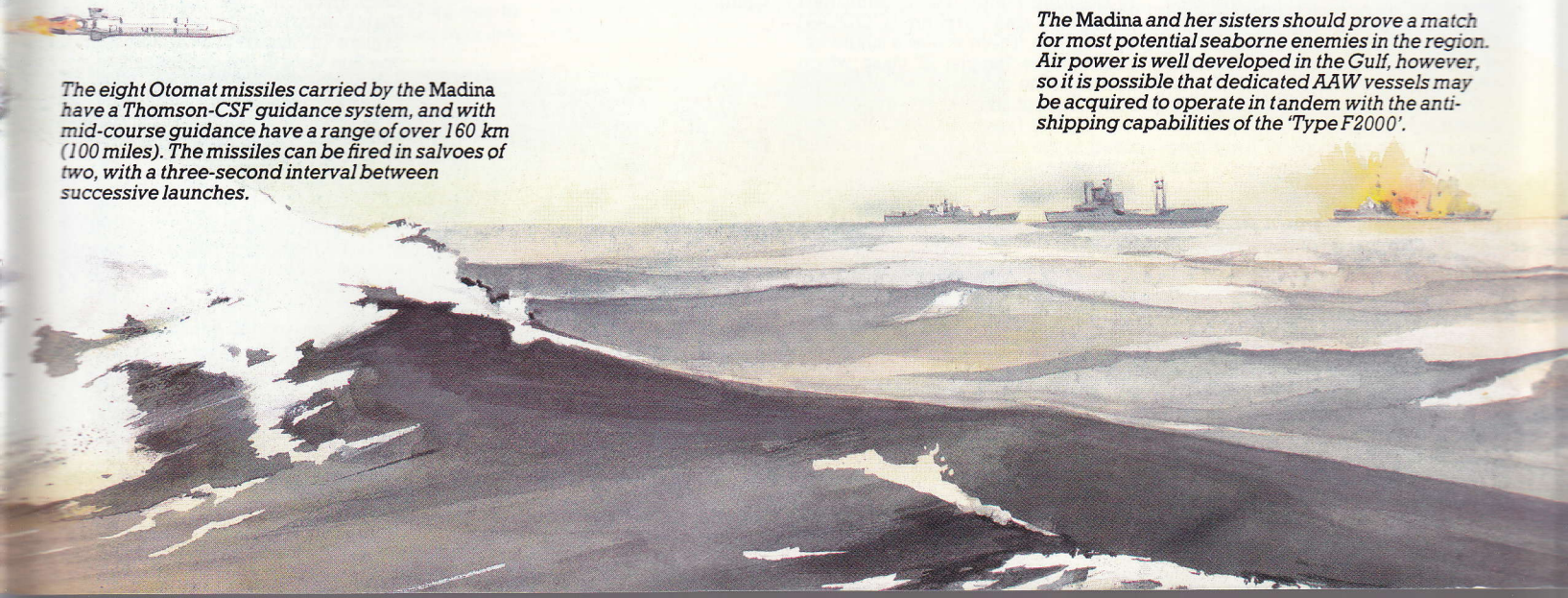
For months to come, accusation and counter-accusation will flood the airwaves and local press, except that no one will admit to a naval engagement even having taken place (unless, of course, it was those brutish Americans picking on undefended Iranian ships again).

Poor old number 144 will be reported as having hit a mine; the two unidentified ships that strayed into the firing zone will be identified, finally, as dhows - and a programme will be set up to equip all trading dhows with radios so that no more accidents can happen. The bombings will be put down to either Libyan-Zionist-inspired terrorists. Qatar radio will come back on, and the Saudi religious leaders will again try to stop it broadcasting subversive Western-style music.

This engagement never actually took place. But if ever it had, it could well have happened in exactly the way just described. The one sure thing is that you will never hear about it.

The eight Otomat missiles carried by the *Madina* have a Thomson-CSF guidance system, and with mid-course guidance have a range of over 160 km (100 miles). The missiles can be fired in salvos of two, with a three-second interval between successive launches.

The Madina and her sisters should prove a match for most potential seaborne enemies in the region. Air power is well developed in the Gulf, however, so it is possible that dedicated AAW vessels may be acquired to operate in tandem with the anti-ship capabilities of the 'Type F2000'.





UK/BRAZIL

'Niteroi' class

Ordered in September 1970 from the English shipyard Vosper-Thornycroft in ASW and general-purpose versions, the **'Niteroi' class** ships were based on the company's Mk 10 frigate design and were constructed both in the UK and Brazil. The four ASW ships are the **Niteroi** (F40), **Defensor** (F41), **Independencia** (F44) and **União** (F45), and are fitted with the Branik missile-launcher system derived specifically for the Brazilians from the Australian Ikara ASW missile system. The two general-purpose units are the **Constituição** (F42) and **Liberal** (F43), and these are similar to the ASW ships though instead of the Branik system they have a second 114-mm (4.5-in) Mk 8 DP gun mount aft (in the place occupied by the Branik system in the ASW ships) and two pairs of container-launchers for MM.38 Exocet SSM missiles located between the bridge and the funnel. Fitted with a combined diesel or gas turbine (CODOG) propulsion plant, the design is considered to be exceptionally economical in terms of manpower when compared with previous warships of this size. A CAAIS action information system is fitted to allow co-ordinated surface-ship ASW and surface strike operations with other vessels of the Brazilian

navy, including the aircraft-carrier **Minas Gerais**.

In June 1981 a modified 'Niteroi' class frigate, the **Brasil** (U27), was ordered for commissioning in 1985 from a local firm as a training ship for the naval and merchant marine academies. Fitted with a light AA armament, the vessel is fitted with a hangar and landing deck aft for two Westland Lynx HAS.Mk 21 helicopters.

Specification

'Niteroi' class

Displacement: 3,200 tons standard and 3,800 tons full load

Dimensions: length 129.2 m (423.9 ft); beam 13.5 m (44.3 ft); draught 5.5 m (18.0 ft)

Propulsion: CODOG arrangement with two Rolls-Royce Olympus TM3B gas turbines delivering 41,759 kW (56,000 shp) and four MTU diesels delivering 11,752 kW (15,760 hp) to two shafts

Speed: 30.5 kts

Armament: (F40, F41, F44 and F45) one Branik ASW missile launcher with 10 Ikara missiles, two triple launchers for 60 Seacat SAMs, one 114-mm (4.5-in) DP and three single 40-mm AA guns, one twin Bofors 375-mm (14.76-in) ASW rocket-launcher with 54 rockets,



The 'Niteroi' class ASW vessel União (F45) has a Branik missile launcher system aft which fires the Australian Mk 44/46 torpedo-equipped Ikara

two triple 324-mm (12.76-in) STWS-1 tube mountings for six Mk 44 or Mk 46 anti-submarine torpedoes, and one rail for five depth charges

Armament: (F42 and F43) four single container-launchers for MM.38 Exocet anti-ship missiles, two 114-mm (4.5-in) DP and three single 40-mm AA guns, one twin Bofors 375-mm (14.76-in) ASW rocket-launcher with 54 rockets, two triple 324-mm (12.76-in) STWS-1 tube mountings for 12 Mk 44 or Mk 46 anti-submarine torpedoes, and one rail

ASW missile. The magazine carries a total of 10 such missiles, which are targeted by both the bow sonar and the VDS system.

for five depth charges

Aircraft: one Westland Lynx HAS.Mk 21 light helicopter

Electronics: one AWS 2 air-search radar, one ZW-06 surface-search radar, two RTN10X fire-control radars, one Ikara tracking radar (not in F42 and F43), one CAAIS action information system, one RDL-2/3 ESM system, one EDO 610E hull-mounted sonar, and (not in F42 and F43) one EDO 700E variable depth sonar

Complement: 201



CHINA

'Jiangnan' and 'Jianghu' classes

In the late 1950s the Chinese assembled in their Hutung shipyard at Shanghai four frigates of the Soviet 'Riga' class from components supplied by the USSR. Known locally as the **'Chengdu' class**, these ships were followed in 1965 by the laying down of the first hull of an indigenous enlarged and modified variant at the Jiangnan shipyard in Shanghai, resulting in the designation **'Jiangnan' class**. Four further units were completed at the Tung Lang shipyard, Guangzhou (Canton) between 1967 and 1969. Four of the class, together with the four 'Chengdu' class ships, serve with the Chinese navy's South Sea Fleet, whilst the 'Jiangnan' class lead ship serves with the East Sea Fleet. At least one of the 'Jiangnans' took part in the combat operations against South Vietnamese naval vessels during the January 1974 occupation of the Paracel Islands. Apart from being larger than the 'Chengdus', the 'Jiangnans' have the major differences of a diesel propulsion plant (instead of geared steam turbines) and that they have not been refitted to carry the Shanghou-Yihou 1 (the Chinese copy of the Soviet SS-N-2 'Styx') anti-ship cruise missile.

Following the political upheaval of the Cultural Revolution the first frigate design to emerge was the **'Jiangdong' class**, two units of which were constructed at the Hutung shipyard between 1970 and 1978. The long building and commissioning times were caused by the fact that the ships were due to carry the first Chinese-designed and -built naval SAM system,

which is still not operational although one of the units has now been seen with missile mountings. The class also introduced into service the first Chinese twin 100-mm (3.9-in) gun mount.

While the 'Jiangdongs' were under construction, a new design for greater anti-ship engagement capability was being formulated. The first three or four units of what became known as the **'Jianghu I' class** were laid down in 1973-4 at Hutung, launched in 1975 and commissioned in 1976. A second shipyard, the Tungmang at Shanghai, is since believed to have joined the programme. An estimated 15 units are in commission with another three at the fitting-out stage and three more under construction. Apart from the 'Jianghu I' series (with a rounded stack for venting the diesel exhaust fumes from its propulsion plant), at least three of those built so far were constructed to the **'Jianghu II' class** design with a squared stack thought to be for a locally-designed and -built combined diesel or gas turbine (CODOG) powerplant. There is also a single example of the **'Jianghu III' class**, which reverts to the rounded stack of the first subgroup but has twin 100-mm (3.9-in) gun mounts (fore and aft) of the type fitted to the 'Jiangdongs'. An eventual total of some 25-30 'Jianghu' class vessels is expected.

Specification

'Jiangnan' class

Displacement: 1,150 tons standard and 1,500 tons full load

Dimensions: length 90.8 m (297.9 ft); beam 10.0 m (32.8 ft); draught 3.9 m (12.8 ft)

Propulsion: four diesels delivering power to two shafts

Speed: 28 kts

Armament: three single 100-mm (3.9-in) DP, four twin 37-mm AA and two twin 14.5-mm AA guns, two 12-barrel RBU1200 ASW rocket-launchers with 120 rockets, four BMB-2 depth-charge throwers and two depth-charge rails with a total of 60 depth charges, and between 40 and 60 mines according to type

Aircraft: none

Electronics: one 'Ball End' surface-search radar, one 'Wok Won' fire-control radar, one 'Fin Curve' navigation radar, one 'High Pole-A' IFF, and one high-frequency hull-mounted sonar

Complement: 185

Specification

'Jianghu' classes

Displacement: 1,568 tons standard and 1,900 tons full load

Dimensions: length 103.2 m (338.6 ft); beam 10.2 m (33.5 ft); draught 3.1 m (10.2 ft)

Propulsion: ('Jianghu I' and 'Jianghu III') two diesels delivering power to two shafts

Propulsion: ('Jianghu II') probably a CODOG arrangement delivering power to two shafts

Speed: 26.5 kts for 'Jianghu I' and 'Jianghu III', and 30 kts for 'Jianghu II'

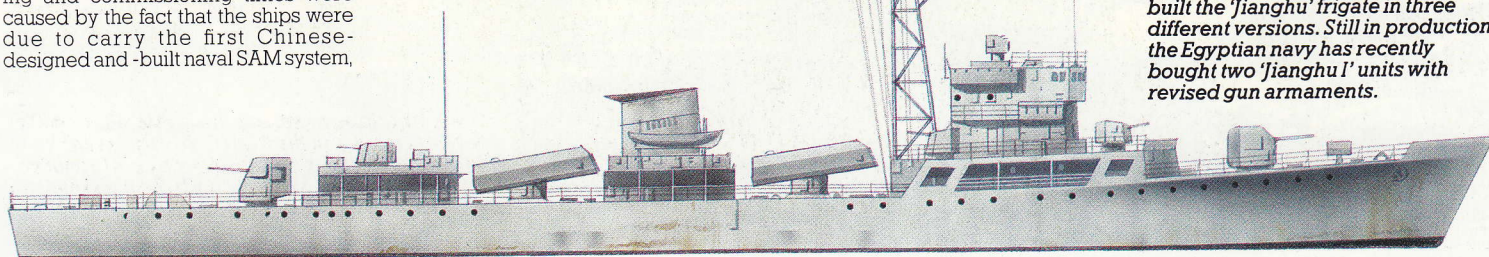
Armament: two twin container-launchers for Shanghou-Yihou 1 anti-ship missiles, two single (or twin in 'Jianghu III') 100-mm (3.9-in) DP and six twin 37-mm AA guns, two or four 12-barrel RBU1200 250-mm (9.84-in) ASW rocket-launchers with 100 or 200 rockets, two racks for 60 depth charges, and between 40 and 60 mines according to type

Aircraft: none

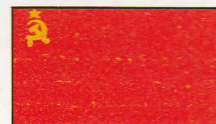
Electronics: one 'Eye Shield' air-search radar (being fitted), one 'Square Tie' missile fire-control radar, one 'Sun Visor-B' fire-control radar (in some), one 'Fin Curve' and/or one 'Don-2' navigation radar, one 'High Pole-B' IFF, one 'Yard Rake' IFF (being fitted), and one high-frequency hull-mounted sonar

Complement: 195

The People's Republic of China has built the 'Jianghu' frigate in three different versions. Still in production, the Egyptian navy has recently bought two 'Jianghu I' units with revised gun armaments.



Soviet Army Part 2



The Motorized Rifle Division

Numerically, the motorized rifle division is the most important of the four types of division used by the Soviet army today, accounting for no less than 136 of the 208 available divisions. During World War II Soviet infantry went into battle on their feet, in trucks or on the sides and decking of tanks, but in the post-war period great efforts were made to mechanize the Soviet infantry. The first armoured personnel carrier to enter service was the BTR-152 6x6 vehicle, which was essentially a modified truck chassis fitted with an armoured body. This was a start, but the vehicle lacked the cross-country mobility required to operate with tanks. In the 1950s the BTR-50 full-tracked vehicle, based on the chassis of the PT-76 light amphibious tank, was introduced. First models had an open top, so the troops were very vulnerable to shell splinters and small arms fire. The introduction of tactical nuclear weapons meant that later production models of the BTR-50 had a fully enclosed troop compartment that was also provided with an NBC system.

The BTR-152 has now been replaced by the BTR-60 series of 8x8 vehicles, which are fully amphibious. The first versions had no overhead protection but later models had a fully enclosed troop compartment and were fitted with the same turret as installed on the BRDM-2 4x4 reconnaissance vehicle and armed with the 14.5-mm (0.57-in) KPVT machine-gun and a 7.62-mm (0.3-in) co-axial machine-gun. More recently the BTR-70 8x8 vehicle has been introduced, but this is almost identical to the BTR-60 in most respects.

The BTR-50 series has been replaced in most front-line units by the BMP-1, which was first seen in public during a display held in Red Square, Moscow, in 1967. The BMP-1 is a mechanized infantry combat vehicle, and differs from the traditional armoured personnel carrier in many ways. First the infantry can aim and fire their rifles and light machine-guns from within the vehicle in almost complete safety from enemy small arms fire as the BMP-1 is fitted with firing ports, each with a periscope above it for aiming purposes. The one-man power-operated turret is fitted with a 73-mm (2.87-in) low-pressure gun fed by an automatic loader which contains both HE and HEAT (high explosive anti-tank) rounds. The maximum range of these rounds, which is affected by high winds, is 1300 m (1,422 yards). A 7.62-mm (0.3-in) machine-gun is mounted co-axial with the 73-mm (2.87-in) gun to deal with softer targets, while mounted over the



The Red Army pioneered the use of mechanized infantry combat vehicles (MICVs) – personnel carriers equipped with powerful armament and extra armour – with the BMP-1, which first appeared in 1967. It is armed with a 73-mm gun with an AT-3 'Sagger' missile, clearly shown here mounted atop the barrel.

73-mm gun is an AT-3 'Sagger' wire-guided anti-tank missile, which has a range of 3000 m (3,280 yards). These weapons enable the BMP-1 to deal with almost any target it encounters on the battlefield. Some vehicles also carry a number of SA-7 'Grail' man-portable SAMs for use in the anti-aircraft role.

The BMP-2 has recently been introduced, and this has a new two-man turret armed with what is believed to be a 30-mm rapid-fire cannon, while mounted on the turret roof is a launcher for the AT-5 'Spandrel' anti-tank guided missile, which is much more effective than the older 'Sagger' as all the operator has to do is to keep his sight on the target to ensure a hit; it also has the longer range of 4000 m (4,374 yards).

The main difference between the motorized rifle divisions (MRD) and the tank division (TD) is the number of tank and motorized rifle regiments in each division and the actual composition of the tank regiments. A motorized rifle division has six regiments, the mix being three motorized rifle, one tank,

one artillery and one anti-aircraft missile regiments. The remaining supporting units are identical to those of the tank division described earlier. Of the three motorized rifle regiments, two are equipped with the wheeled BTR-60/BTR-70 vehicle while the third has the BMP-1 tracked MICV. Each BTR-60/BTR-70 motorized rifle regiment has an anti-tank battery which has three platoons each with three BRDM-2 4x4 vehicles armed with AT-2 'Swatter', AT-3 'Sagger' or AT-5 'Spandrel' anti-tank missiles. Regiments equipped with the BMP-1/BMP-2 have an anti-tank capability on each vehicle in the shape of a 'Sagger' or 'Spandrel' ATGW, and therefore lack any organic anti-tank batteries.

Each motorized rifle division also has a divisional anti-tank battalion not found in the tank division. This did have three batteries each with six 100-mm (3.94-in) T-12 anti-tank guns towed by MT-LB multi-purpose tracked vehicles, but most front-line divisional anti-tank battalions now have two six-gun batteries of T-12s and a nine-vehicle battery of BRDM-2s with ATGWs. Some motorized rifle divisions also have an independent tank regiment.

To enable the divisional commander to carry out his assignment he must have information on the position, force and movements of the enemy. This information can come from Front level, but the divisional commander also has a reconnaissance battalion under his own command. This battalion is identical to that in both the motorized rifle and tank divisions, and has an HQ and service company, two BMP reconnaissance companies, one scout car reconnaissance company and one radar/radio reconnaissance company. Its total equipment includes six MBTs, 13 BRDM-2s, two BTR-60s and 15 BMP-1s; included in the BMP-1 total are three of the special reconnaissance model, which lacks the 73-mm (2.87-in) gun of the basic vehicle but has equipment to monitor enemy communications, direction-finding equipment and battlefield surveillance radars.

Two of the three regiments in a motor rifle division are equipped with the BTR-60. A tough, reliable vehicle with excellent cross-country performance, it is fully amphibious and armed with the same turret as the BRDM-2 armoured car, which carries a 14.5-mm machine-gun and a coaxial 7.62-mm MG.





One of the more recent additions to some tank and motorized rifle divisions is the helicopter squadron. This has a squadron HQ, signals, maintenance and armament sections, and six flights, each of which has three helicopters, so giving the squadron a total of 18 helicopters. The helicopters comprise six Mil Mi-2 'Hoplitest' which can each carry a maximum of eight troops, six Mi-8 'Hips' which can each carry 32 troops, and six of the deadly Mi-24 'Hinds' which can carry troops as well as an offensive load of rockets and missiles.

The engineer battalions of both types of division are almost identical, although their equipment does vary slightly. The battalion has an HQ, and combat engineer, pontoon bridge, road/bridge construction, technical and assault river crossing companies, plus platoons for reconnaissance, communications, maintenance and service. The engineering battalion will fulfil a vital role in any war in Europe as there are so many rivers and streams to cross. The BMP, BTR-60/BTR-70 and BRDM-2 vehicles are fully amphibious, but much of the other equipment used by the division, such as trucks and trailers, has only a limited fording capability. The T-64/T-72 tanks can all be fitted with a snorkel which enables them to ford to a depth of 5.5 m (18 ft), but the river bed must be firm and entry/exit points have to be chosen with care. The signals company is equipped with extensive communications equipment and generators. The motor transport battalion has a battalion HQ, an ammunition transport company, a POL (petrol, oil and lubricants) company and a cargo transport company. It also has maintenance, supply/service and medical elements.

With so many tracked and wheeled armoured vehicles in service, maintenance is a major problem so each division has a maintenance battalion with a

strength of about 250 officers and men.

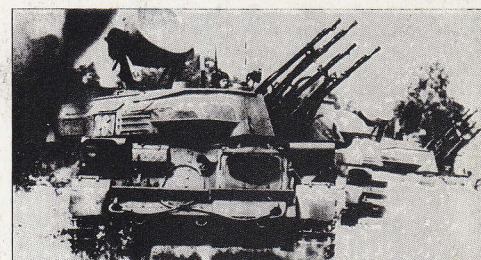
Almost all Soviet armoured vehicles are now fitted with an NBC system, and many of the rockets and artillery weapons can fire chemical munitions. NBC protection equipment is issued on a large scale and many exercises are conducted in full NBC gear. Each division also has a chemical defence battalion which has a battalion HQ, service, reconnaissance and support platoons and two decontamination companies. Each of the last is issued with special vehicles for the rapid decontamination of weapons and equipment.

The Soviets have realized that there will be many casualties in time of war, so each division has a medical battalion. This has a battalion HQ, transport, supply/service and disinfection/decontamination platoons, plus medical and collection/evacuation companies.

Tactics

Since the end of World War II the Soviets have sought to build up a balanced army of tank and motorized rifle divisions which are well suited to offensive operations on both conventional and nuclear battlefields. They are well aware that tanks cannot operate alone and need the active support of the other arms including infantry, artillery, air-defence forces, engineers and air support elements, both fixed-wing and helicopter. The lessons learned by the Israeli army in the early days of the 1973 Middle East campaign are well known in the Soviet army, whose tactics now take into account the increasing number of ATGWs being fielded in the West.

In the Soviet army there are three basic types of offensive action: the meeting engagement, the breakthrough attack and the pursuit. The first of these involves attacking the enemy on the move and is considered to be the most important type of offensive action. In this type of operation part of the Soviet unit tries to pin down the enemy unit while the main part moves to outflank or envelop the enemy. The breakthrough attack is designed for use against an enemy in a defensive position. If possible, these positions should be bypassed and neutralized by following units, but the Soviets realize that in



The radar-directed cannon of the Shilka ZSU-23-4 are rated as significantly more effective than the US M167 Vulcan system and pose a major threat to NATO ground attack aircraft, on which so much hope is pinned.

many cases such strongpoints will have to be attacked as soon as possible so that the advance is not delayed. If there is time a careful plan will be made to subject the defensive position to a hail of artillery and rocket fire in an effort to destroy as much of the enemy as possible (especially ATGWs) before the main attack goes in. Once the enemy position has been overcome the advance will continue, probably with fresh troops, and meeting engagements will then take place again. The pursuit presents the Soviets with significant command and control problems as the situation can change so quickly. They will try to pursue enemy units or even race ahead by another route to block off their line of escape. Helicopters could be used to drop off blocking teams behind enemy lines.

In recent years the Soviets have been placing greater emphasis on units designed to fight well ahead of the main force. These units will have tanks, infantry, artillery and engineers, and are intended to create havoc in the rear areas as enemy reserves are moving to the front-line area.

In conclusion, it must be admitted that the Soviet army is the most powerful in the world, and is being strengthened constantly by the introduction of new weapons. It has great mobility, firepower and flexibility, and its tactics are changing to take into account the introduction of new weapons by the potential enemy.

A combined arms attack: infantry dismount from BTR-60s as tanks spearhead the assault. Soviet exercises are brutally realistic, casualties being readily accepted as the price of combat efficiency. While the intentions of the Communist leadership remain as inscrutable as ever, there can be no doubt as to the very great capability of the Red Army.

